36 RH Corsair

Owner's Manual

Model Year 2014

CHRIS-CRAFT CORPORATION

8161 15TH STREET EAST SARASOTA FL 34243 USA

1-(941) 351-4900 www.chriscraft.com

Dear Chris-Craft 36 RH Corsair Owner:

On behalf of the entire team at Chris-Craft, thank you for selecting our product. We appreciate the confidence that you have shown in our company and products. As I'm sure you've discovered during the selection and decision process, your Chris-Craft has been designed, engineered and built with care and precision.

Our unwavering commitment is to provide you, our customer, with the finest quality boat available. The information in this owner's manual has been assembled to assist you with your Chris-Craft for maximum safety and enjoyment. Please read this manual completely and always operate your boat safely and courteously.

We all wish you many years of boating fun and safety.

Sincerely,

Stephen Heese

President

Chris-Craft

Your **CHRIS-CRAFT** 36 Corsair Owner's Manual has been written to include a number of safety instructions to assure the safe operation and maintenance of your boat. These instructions are in the form of **WARNING** and **CAUTION** statements. The following definitions apply:

WARNING

HAZARDS OR UNSAFE PRACTICES WHICH COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH.

CAUTION

Hazards or unsafe practices which could result in minor personal injury, or product and property damage.

All instructions given in this book are as seen from the stern looking toward the bow, with starboard being to your right, and port to your left. A glossary of boating terms is included in the Appendix.

IMPORTANT NOTE: Your boat uses internal combustion engines and flammable fuel. Every precaution has been taken by **CHRIS-CRAFT BOATS** to reduce the risks associated with possible injury and damage from fire or explosion, but your own precaution and good maintenance procedures are necessary in order to enjoy safe operation of your boat.

If for any reason you have trouble with your **CHRIS-CRAFT** Owner's Manual, or require replacement pages, please contact our Customer Service department at the address on the cover page. We will be happy to supply replacement pages at no charge. This manual has been compiled to help you to operate your boat with safety and pleasure. It contains details of the boat, the equipment supplied or fitted, its systems, and information on its operation and maintenance.

Please read it carefully, and familiarize yourself with your **CHRIS-CRAFT** before using it.

Chris-Craft

If this is your first boat, or you are changing to a type of boat you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before assuming command of the craft. Your dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools, or competent instructors.

PLEASE KEEP THIS MANUAL IN A SECURE PLACE AND PRESENT IT TO THE NEW OWNER WHEN YOU SELL THE BOAT.

Owner’s manuals for the installed equipment on your boat have also been provided for your reference. They have been stored in a valise that is included in your new boat. Please read this information, and also hand them over to the new owner when you sell the boat.

Chris★Craft

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Chapter 1

Introduction

A Chris-Craft is a blend of the best of classic design, distinctive styling and superb naval engineering focused on producing truly seaworthy boats. Chris-Craft's dedication to craftsmanship and quality totally differentiates its boats from others and represents the company's enduring devotion to its proud past. America's best naval architects, designers, boat builders and furniture makers are committed to continuous new product development and technology and maintaining Chris-Craft as America's only premium boat brand, thus setting standards beyond perfection.

The Owner's Manual

This manual is written to meet the recommendations of ***Technical Information Report T-24, Owner's Manuals***, published by the American Boat and Yacht Council (ABYC) and the International Standard ***ISO 10240: Small Craft – Owner's Manual***.

In the United States, the American Boat and Yacht Council is a marine industry-based standards organization that publishes Standards and Recommended Practices for Small Craft. The book is an extensive collection of construction and design standards for small craft that is used as a guide by boat builders throughout the world. For more information contact:

American Boat & Yacht Council
613 Third Street, Suite 10
Annapolis, MD 21403
Phone: (410) 990-4460
Fax: (410) 990-4466
https://www.abycinc.org

This manual is compiled to aid in the operation of the Chris-Craft line of boats in a safe and enjoyable manner. It contains information on the systems, equipment operation, and general maintenance on each model of boat. Many of the systems in the Chris-Craft line are similar among the various models, where differences do occur, they will be pointed out and explained.

This manual provides up-to-date information on various systems at the time this vessel was manufactured. Specifications of engines and other components are all subject to change without notice. The data contained herein is subservient to the manufacturers' manuals of the numerous components, installed in this vessel. If a discrepancy exists between this manual and the component manual, the component manual takes precedence.

This owner's manual is not a course on boating safety or seamanship. If this is your first craft, or if you are changing to a type of craft you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before assuming command of the craft.

Always use trained and competent people for maintenance, repair, or modifications. The boat builder cannot be held responsible for modifications he has not approved.

Any craft, no matter how strong it may be, can be severely damaged if not used properly. This is not compatible with safe boating. Always adjust the speed and direction of the craft to the sea conditions. Ensure that the anticipated wind and sea conditions corresponds to the design category of your craft, and that you and your crew are able to handle the craft in these conditions.

All persons should wear suitable buoyancy aid (life jacket/personal flotation device) when operating your boat.

It is incumbent upon the owner/operator to stay informed of any changes and/or modifications that affect any component of this vessel and/or the safety of the vessel.

KEEP THIS MANUAL IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER WHEN YOU SELL THE CRAFT.

Chris-Craft boats are proudly manufactured in the United States of America by the Chris-Craft Corporation.

Chris-Craft Corporation

8161 15th Street East
Sarasota, FL 34243
Phone: (941) 351-4900
Fax: (941) 358-3776

What This Manual Covers

NOTICE

The features and specifications discussed in this manual are subject to change without notice. Chris-Craft reserves the right to discontinue any model and make changes, at any time, in colors, equipment, specifications, materials, and prices. Chris-Craft is not obligated to make, or provide, similar changes to any model previously sold.

This manual covers the following Chris-Craft models:

36 RH CORSAIR

Each of these models share common components which are discussed in this manual. If significant differences occur between models these differences are discussed.

Each model offers various upgrades and options. When you take possession of your Chris-Craft you receive the appropriate manuals associated with options you may have chosen, consequently options and upgrades are not discussed in this manual.

As the owner/operator it is your responsibility to familiarize yourself with the specific characteristics of your boat.

General Specifications

Performance

Performance is based upon the type of options you selected for your Chris-Craft. When you take possession of your boat you receive the appropriate books for your boat. As the owner/operator it is your responsibility to familiarize yourself with the performance specifications and maintenance requirements of your engine.

Table 1.1 General Specifications

Model	36 RH Corsair	
Overall Length	38’ - 2”	11.6 m
Beam	12’ - 6”	3.8 m
Dry Weight	16,000 lbs	7,258 kg
Deadrise	20 degrees	
Draft	31”	78.7 cm
Fuel Capacity	270 gallons	1,022 Liters
Water Capacity	50 gallons	189 Liters

Table 1.2 Maximum Person Capacities

Model	36 RH Corsair
U.S. Standard	N/A
CE Standard	11

Table 1.3 Bridge Clearances

Model	36 RH Corsair	
U.S. Standard	7’ - 7”	2.28 m

Engine Performance

Engine performance is based upon the type of engine option you selected for your Chris-Craft. When you take possession of your boat you receive the appropriate engine books for your boat. As the owner/operator it is your responsibility to familiarize yourself with the performance specifications and maintenance requirements of your engine.

Weight Conversions

Weight and loading attributes are important for safe boating. Use the following table to approximate the weights and liquids carried aboard the boat.

Table 1.4 Weight Conversions

Item (Gallons)	For Lbs. Per Gallon Multiply by:		For Kilograms Multiply pounds by:	
Gasoline (270)	**6.1 lbs**	**1647.0 lbs (270)**	**0.4536**	**707.07 kg (270)**
#2 Diesel Fuel (270)	**7.05 lbs**	**1903.5 lbs (270)**	**0.4536**	**863.41 kg (270)**
Potable Water (50)	**8.33 lbs**	**416.5 lbs (50)**	**0.4536**	**188.9 kg (270)**

1 gallon of gasoline = 6.1 pounds

1 gallon of #2 diesel fuel = 7.05 pounds

1 gallon potable Water = 8.33 pounds

1 pound = 0.4536 kilograms

Design Category

Every boat built, regardless of manufacturer, falls within a specific design category applicable to that model. Currently there are four (4) categories designated by the ISO 10240 Standard. They are:

- Category A – Ocean: Craft designed to operate in winds that may exceed wind force 8* (34-40 knots/39-46 mph) and in significant wave heights of 4 meters (13 feet) and above. These vessels are largely self-sufficient. Abnormal conditions such as hurricanes are excluded. Such conditions may be encountered on extended voyages, such as ocean crossings or inshore when unsheltered from the wind and waves for several hundred nautical miles.
- Category B – Offshore: Craft designed to operate in winds up to, and including, wind force 8* (34-40 knots/39-46 mph) and in significant wave heights up to, and including, 4 meters (13 feet). Such conditions may be encountered on offshore voyages of sufficient length or on coastal waters when unsheltered from the wind and waves for several dozens of nautical miles. These conditions may also be experienced on inland seas of sufficient size for the wave height to be generated.
- Category C: Craft designed to operate in winds up to, and including, wind force 6* (22-27 knots/25-31 mph) and in wave heights up to, and including, 2 meters (7 feet). Such conditions may be encountered in exposed inland waters, in estuaries, and in coastal waters in moderate weather conditions.
- Category D: Craft designed to operate in winds up to, and including, wind force 4* (11-16 knots/13-18 mph) and in wave heights up to, and including, 0.3 meters (1 foot) with occasional waves of 0.5 meters (2 feet) maximum height. Such conditions may be encountered in sheltered inland waters and in coastal waters in fine weather.

  * Wind force is based upon the Beaufort Scale.

  For categories A, B, and C, the significant wave height is the average height of the highest one-third of the waves, which approximately corresponds to the wave height estimated by an experienced observer. Some waves will double this height.

The boats addressed in this manual are certified as follows:

BOAT	CATAGORY
36 RH Corsair	**B**

Component Manufacturers

Chris-Craft uses numerous vendors in the manufacturer of their boats. Each major component comes with an owner's or operation manual which provides information on component operation, troubleshooting and warnings.

Table 1-5 contains a list of vendors that provide components for Chris-Craft.

Table 1-5. Vendor Directory

CANVAS	**Ameritex Fabric Systems** Taylor Made Group, LLC 1900 47th Terrace East Bradenton, FL 34203 Phone: (941) 747-1900 Fax: (941) 749-5000 **www.ameritexfabrics.com**	**ENGINES**	**Mercury Marine** W6250 W. Pioneer Road P.O. Box 1939 Fond du Lac, WI 54936-1939 Phone: (920) 929-5040 Fax: (920) 929-5893 **www.mercurymarine.com**
BATTERY CHARGER	**Professional Mariner, LLC** PO Box 968 Rye, NH 03870 Phone: (603) 433-4440 Fax: (603) 433-4442 **www.pmariner.com**		**Volvo Penta of the Americas, Inc.** 1300 Volvo Penta Drive Chesapeake, VA 23320-9860 Phone: (603) 433-4440 Fax: (603 433-4442 **www.volvo.com**
TEAK	**Teak Decking Systems** 7061 15th Street Sarasota, FL 34243 Phone: (941) 756-0600 Fax: (941) 756-0406 **www.teakdecking.com**	**WINDSHIELD**	**Taylor Made Systems New York** 93 South Boulevard Gloversville, NY 12078 Phone: (518) 773-0636 Fax: (518) 773-2919 **www.taylormarine.com**
ELECTRIC HATCH RAM	**LINAK U.S. Inc.** 2200 Stanley Gault Parkway, Louisville KY 40223 Phone: +1 502 253 5595 Fax: +1 502 253 5596 **www.linak-us.com**	**GUAGES**	**DTS - Mercury Marine** **www.mercurymarine.com** **EVC - Volvo Penta** **www.volvo.com**
BILGE PUMPS	**XYLEM Flow Controls** 100 Cummings Center Drive Suite 535-N Beverly, MA 01915 Phone: (978) 282-5262 Fax: (978) 281-4320 **www.rule-induistries.com**	**ENGINE BLOWERS**	**SHURflo, LLC** 13265 Collection Center Drive Chicago, IL 60693 Phone: (800) 264-2169 Fax: (574) 264-2169 **www.shurflo.com**

Component Manufacturers *(Continued)*

ELECTRONIC EQUIPMENT	**Raymarine Inc.** 9 Townsend West Nashua, NH 03063 Phone: (603) 324-7900 Fax: (603) 324-7995 **www.raymarine.com**	**GELCOAT**	**HK Research Corp.** P.O. Box 1809 Hickory, NC 28603 Phone: (800) 334-5975 Fax: (828) 328-1721 **www.hkresearch.com**
HOSES	**HK Research Group** 34929 Curtis Boulevard East Lake, OH 44095 Phone: (440) 942-1320 Toll Free: (800) 845-5255 Fax: (440) 942-1965 **www.marinehose.com**	**TRIM TABS**	**Bennett Marine** 550 Jim Moran Blvd. Deerfield Beach, FL 33442 Phone: (954) 427-1400 Fax: (954) 480-2897 **www.bennetttrimtabs.com**
REFRIGERATOR COOLING UNIT	**Vitrifrigo America LLC** 2200 NW 32 ST. Suite 1200 Pompano Beach FL 33069 Phone: (954) 979-7737 Fax: (954) 979-7740 **www.vfamerica.com**	**WATER PUMP**	**SHURflo, LLC** 5900 Katella Ave. Cypress, CA 90630 Phone: (562) 795-5200 Phone: (800) 854-3218 Fax: (562) 795-7564 **www.taylormarine.com**
STEERING HELM	**Mercury Marine** W6250 W. Pioneer Road P.O. Box 1939 Fond du Lac, WI 54936-1939 Phone: (920) 929-5040 Fax: (920) 929-5893 **www.mercurymarine.com**	**THROTTLE SHIFT CONTROLS & CABLES**	**Mercury Marine** W6250 W. Pioneer Road P.O. Box 1939 Fond du Lac, WI 54936-1939 Phone: (920) 929-5040 Fax: (920) 929-5893 **www.mercurymarine.com**
STEREO COMPONENTS	**Rockford Fosgate** 600 South Rockford Drive Tempe, AZ 85281 Toll Free: 1-800-669-9899 Phone: (480) 967-3565 Fax: (480) 967-8132 **www.rockfordfosgate.com**		**Rockford End Consumer Contact Person** Nelson Arzadon Electronic Technical Manager Direct Phone Number: (574) 970-8348 **www.arzadonn@patrickind.com**
CANVAS	**Chris Craft Customer Service** 8161 15th Street East Sarasota, Florida 34243 Phone: (941) 351-4900 Fax: (941) 358-3717 **www.chriscraft.com**		**Ameritex Fabric Systems** Taylor Made Group, LLC 1900 47th Terrace East Bradenton, Florida 34203 Phone: (941) 747-1900 Fax: (941) 749-5000 **Www.ameritexfabrics.com**

CHAPTER 2

Safety and Operations

As the owner/operator of your Chris-Craft, it is your responsibility to be safety conscious at all times. This includes, but is not limited to:

- Know and understand the limitations of both yourself and your vessel.
- Understand and follow the "**rules of the road.**"
- Understand the potential hazards of boating.
- Deliberately stay out of weather conditions that exceed the operator's capability.
- Keeping your passenger's safety in mind at all times.
- Operate the vessel in a proper manner when encountering limited visibility, rough water, and other weather or people induced factors.
- Understanding how to administer first aid, including CPR
- Know how to treat hypothermia.
- Be ready for emergencies.

This chapter addresses numerous safety and responsibility topics which you need to be familiar with. It is not all-inclusive, but rather provides a starting point for your boating knowledge.

There are numerous **WARNINGS, CAUTIONS, and NOTICES** presented in this manual and the manufacturers' supplied literature.
As the owner/operator, it is your responsibility to replace any label that becomes illegible. Replacement labels may be obtained from Chris-Craft.

The safety signs and warnings in this manual conform to ***American Boat & Yacht Council Standard T-5, Safety Signs and Labels***. Each of the labels are illustrated below with an explanation of the hazard level.

This manual is not all inclusive, and does not constitute all of the Warnings, Cautions, and Notices that should be recognized and practiced. This manual does not incorporate all the safety practices you should use in boating.

Immediate hazards that WILL result in severe personal injury or death if the warning is ignored.

Hazards or unsafe practices that COULD result in severe personal injury or death if the warning is ignored.

Hazards or unsafe practices that could result in injury, product, or property damage if the warning is ignored.

Notice is used to notify people of installation, operation, or maintenance information, which is important, but not hazard related.

The following symbols are used in conjunction with the Warning statements to indicate a hazardous condition exists and that precautions must be followed to prevent injury or death.

Explosion

The rapidly expanding symbol shows that the material may explode if subjected to high temperature, sources of ignition, or high pressure.

Chemical or Hot Water Hazard

The symbol represents a hazard to skin. The appropriate type of gloves shall be worn to protect skin.

Eye Protection

The symbol of a person wearing goggles indicates that the material will injure the eyes.

Fire

The fire symbol indicates that the material may ignite and cause burns.

Poison

The skull and crossbones symbol indicates the material is poisonous or a danger to life.

Vapor

The symbol of a human figure in a cloud shows that material vapors present a danger to life or health.

INDEX OF WARNING PLACARDS AND DECALS

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Figure 2.1c ..... Overboard Discharge Operation
Figure 2.1d ..... Do Not Stand On Table
Figure 2.1e ..... Fuel Vapors Are A Fire and Explosion Hazard
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Figure 2.1h ..... Prevent Falls Overboard
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Figure 2.1u ..... Caution Fire In The Engine Room
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Figure 2.1x ..... Shut Off Motors Near Swimmers
Figure 2.1y ..... NMMA Certification Plate
Figure 2.1z ..... Never Approach Ladder With Engine Running

Figure 2-1.

Figure 2-1a.

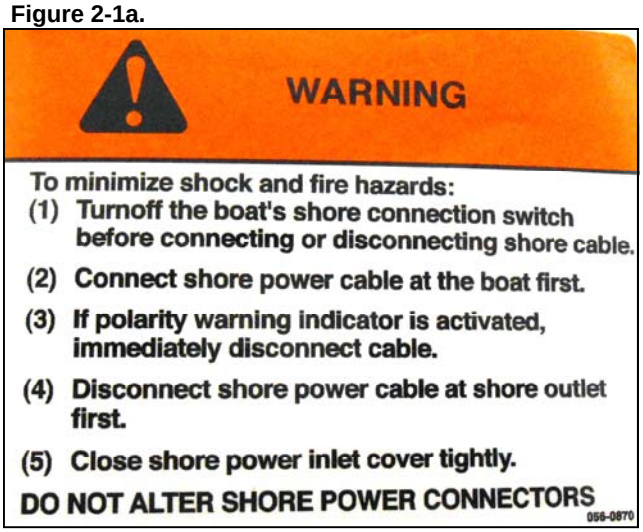


Figure 2-1b.

Figure 2-1d.

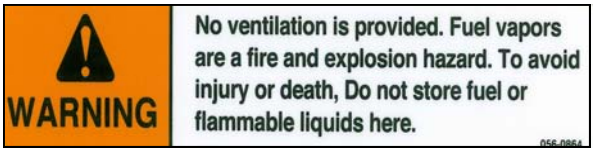


Figure 2-1e.

Figure 2-1f.

Figure 2-1g.

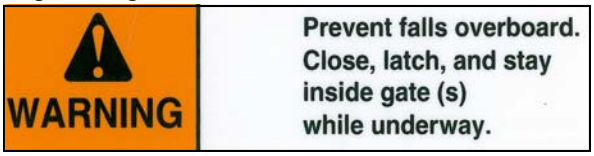


Figure 2-1h.

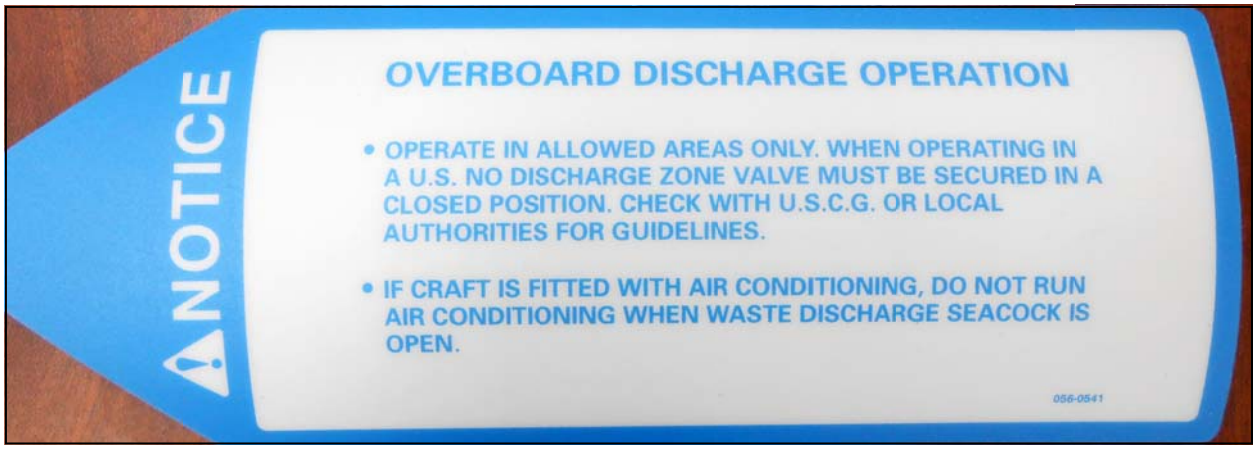


Figure 2-1c.

Warning Placards and Labels

Each model of boat has warning placards and labels that you must become familiar with. These warnings indicate a condition that, if not followed, may result in injury and/or damage to the boat.
If a warning placard/label becomes unreadable, Federal Law dictates that it must be replaced with a new one. To obtain a replacement warning placard, contact Chris-Craft directly.

Figure 2-1i. Carbon Monoxide Label

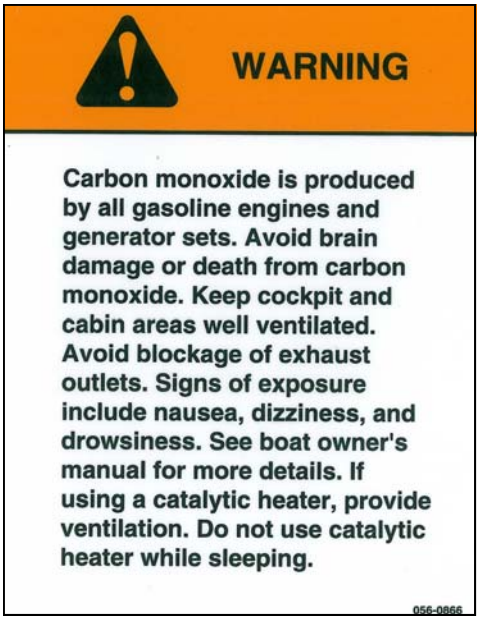


Figure 2-1k. Carbon Monoxide Label

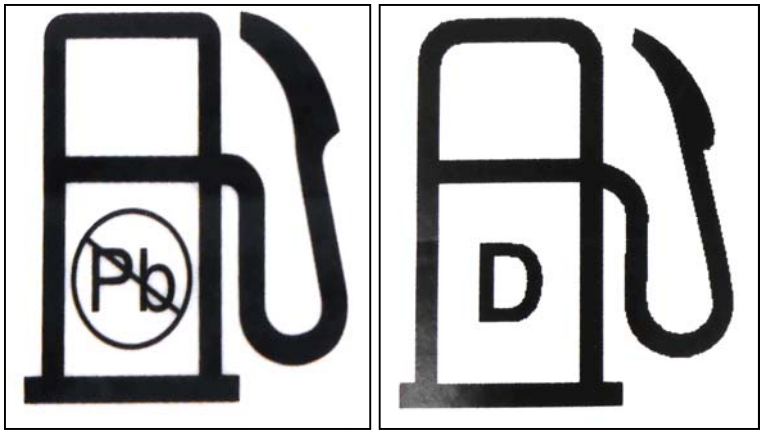


Figure 2-1j. Diesel Fuel and Gasoline ID Labels

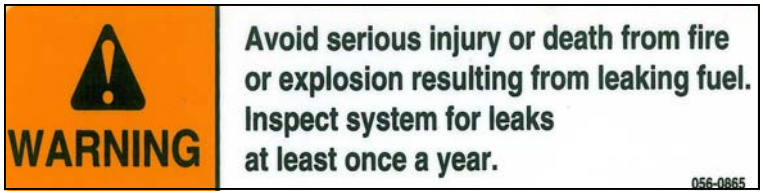


Figure 2-1l. Leaking Fuel Label

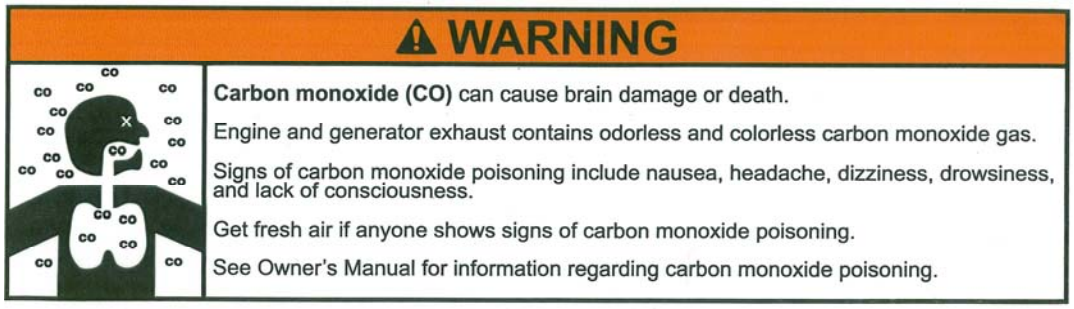
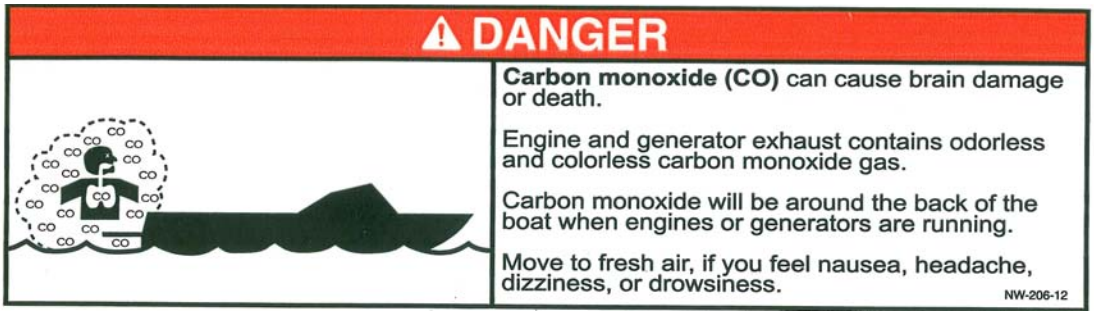


Figure 2-1m. Carbon Monoxide Label



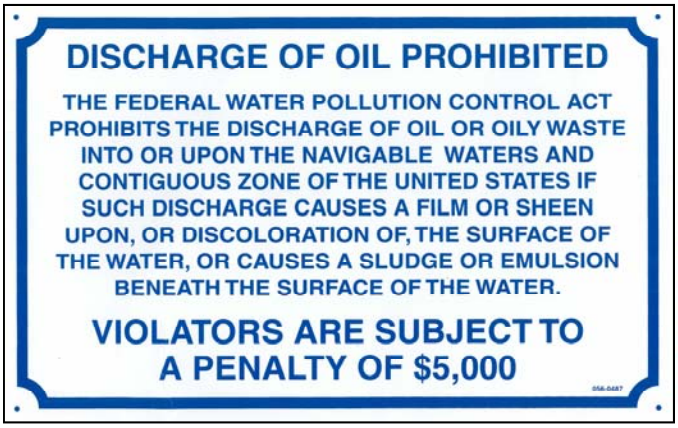


Figure 2-1n. Discharge Of Oil Prohibited

Figure 2-1o. Yacht Certification

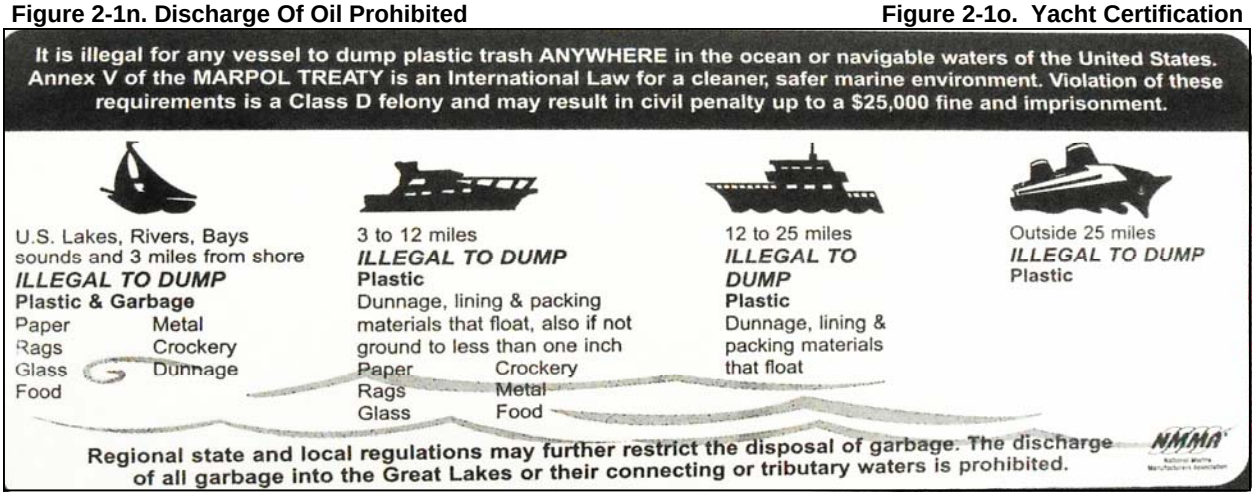


Figure 2-1p. Illegal To Dump

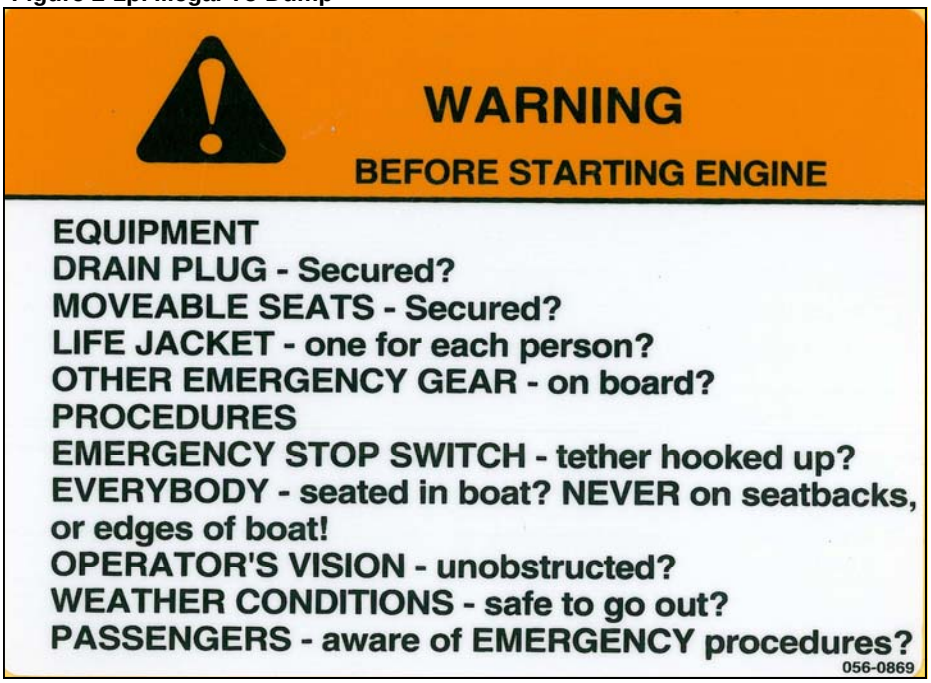


Figure 2-1q. Warning Before Starting

Figure 2-1r. Fire Extinguisher

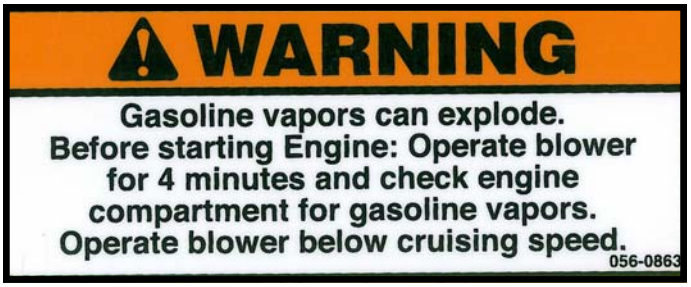


Figure 2-1s. Gasoline Vapors

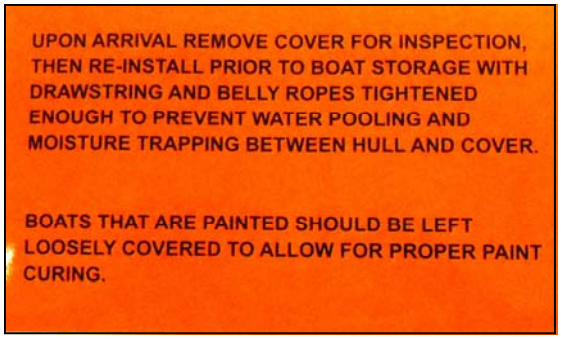


Figure 2-1t. Boat Covers

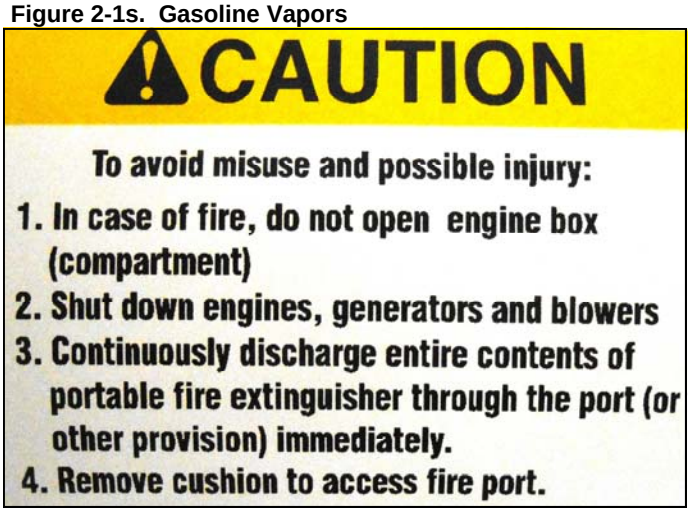


Figure 2-1u. Engine Room Fire

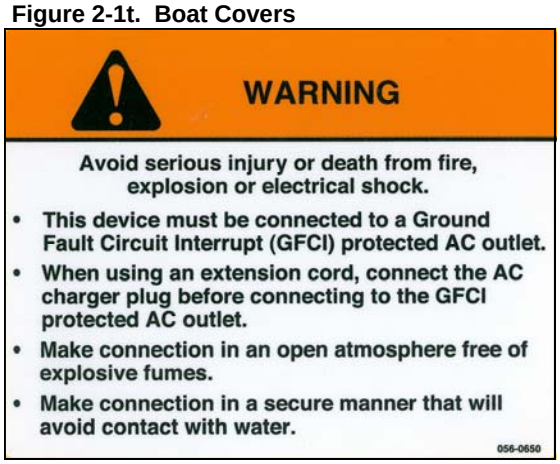


Figure 2-1v. GFCI Warning

Figure 2-1w. Latch Seat & Refrigerator

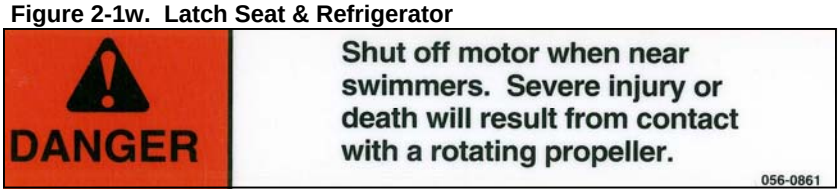


Figure 2-1x. Shut Off Motor

Figure 2-1y. NMMA Certified

Figure 2-1z. Never Approach Ladder

Boating Safety

Operating your Chris-Craft without proper experience and/or without full understanding of the boat and its systems can cause serious injury. The owner/operator must read and understand this manual and the manufacturers' manuals supplied with it before operating the vessel. Do not operate the boat if existing or anticipated conditions are beyond your level of experience.

Boating safety cannot be overemphasized. Understand the rules of the road and operate your vessel in a safe manner. Understand the potential hazards of boating. Be prepared for emergencies.

For additional information contact the United States Power Squadron and the United States Coast Guard Auxiliary at:

United States Coast Guard Auxiliary Flotilla
http://www.usps.org/

As the owner/operator, it is your responsibility to become completely familiar with the Chris-Craft before operating the vessel. Read and understand this manual and various manufacturers' manuals accompanying this manual.

If you have any questions regarding your Chris-Craft or the factory installed equipment, contact your dealer or Chris-Craft at (941) 351-4900.

General Safety Precautions

Boating is a great recreation activity. However, emergencies on the water do happen and as the owner/ operator it is your responsibility to be prepared for them.

This safety list is general in nature and not all-inclusive. Common sense is always the best route to follow when boating.

- Mechanical safety.
  – When working around operating machinery, such as the engines, always wear hearing protection.
  - Eye protection is always a good idea.
  – Understand operating machinery becomes hot. Wear proper protection such as gloves.
  – Take all proper precautions when working around moving parts. Wear tight fitting clothes as loose clothing may get caught in moving parts.
  – Beware of toxic gases. What you don't see and/or smell can kill you.
  – Understand all the safety precautions associated with mechanical maintenance.
- Know the limits.
  – Understand your own limits.
  – Understand the limits of your boat. Don't overload the vessel. Distribute weight evenly.
  – Follow your checklists to ensure you don't miss an important item.
- If you don't know how, learn to swim. Many Red Cross chapters offer swim courses that you can take advantage of.
- Keep the boat free of oil and grease. A fall on a slippery deck or ladder can have very serious consequences.
- When cruising, monitor the weather. Weather at sea can change rapidly. Be prepared.
- Be ready for emergencies. This chapter is a good starting point for understanding how to handle common emergencies.
- Carry the proper safety equipment. Carry a set of tools for emergency repairs. Keep extra batteries for flashlights and other battery-operated equipment.

Best Defense – Common Sense.

Boating Courses

Operating a boat requires a greater skill than operating a car or truck. To enjoy a pleasurable and safe boating experience you must acquire these skills. Some recommendations are:

- Take a Coast Guard, United States Power Squadron boating safety course.
  - For information go to: http://www.usps.org/
- Take a boating safety course offered by local colleges or boating clubs.
- Obtain “hands-on” training from qualified personnel on how to operate your vessel.

Boating courses help you to gain knowledge and experience in such areas as, but is not limited to: navigation, seamanship, rules of the road, weather, safety at sea, survival, first aid, communications, and pollution control.

Basic Seamanship

As the owner/operator it is your responsibility to learn the “rules-of-the-road” and understand basic seamanship rules and standards, as only rudimentary information is repeated here.

In practical terms boats that are less maneuverable have the right-of-way over more agile vessels. In general a power-driven vessel must give way to the following:

- A sailing vessel under sail only (engines not running).
  – When the sailboat is under engine power, it is considered a power-driven vessel.
- Vessels propelled by oars or paddles.
- A commercial fishing vessel engaged in fishing.
  – This does not apply to sport fishers or party boats.
- Vessels with restricted maneuverability, such as:
  – Tow boats.
  – A vessel engaged in dredging activities or work that restricts it to a specific area.
  – A vessel engaged in the transfer of supplies from one vessel to another.
- A vessel not under command, broken down.

Meeting Situations

When meeting in various situations the give-way vessel must take action to avoid a collision and maintain a safe distance. The stand-on vessel should maintain course and speed.

If it becomes apparent that a collision is possible and the give-way vessel is not taking corrective action, it is your responsibility to take action and avoid a collision.

Meeting Head-On

When two boats meet head-on neither boat has the right-of-way. Both boats should reduce speed and pass port-to-port (Figure 2-3).

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When two boats meet head-on neither boat has the right-of-way. Both boats should reduce speed and pass port-to-port (Figure 2-3).

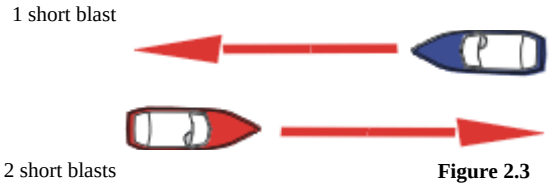


Figure 2.3

If it is not possible to pass port-to-port due to some obstruction or other boat traffic, you should sound two short blasts to indicate that you are intending to pass starboard-to-starboard (Figure 2-4). Ensure the other boat understands your intentions before proceeding.

Figure 2.4

Crossing

When engaged in a crossing situation, where two vessels are approaching at right angles (or close to) and a risk of collision exists, the vessel on the right is the stand-on vessel and must hold course and speed. The give-way vessel must maneuver in such a way as to keep clear of the stand-on vessel. The give-way vessel must pass to the stern of the stand-on vessel. The give-way vessel shall slow, stop, or reverse to allow the stand-on vessel to pass.

Overtaking

If one boat wishes to overtake (pass) another boat, the vessel astern must initiate the signal indicating his desire to pass. The vessel being passed (overtaken) is the stand-on vessel. The boat doing the passing (overtaking) is the give-way vessel (Figure 2-5).

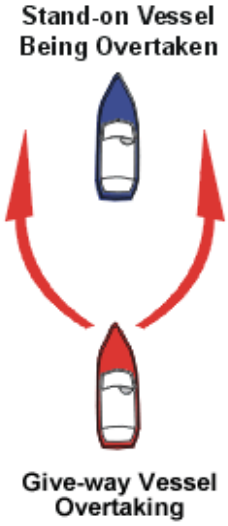


Figure 2-5

Visual Obstructions

When piloting the boat, the operators vision may be obstructed by high trim angles and the sea state. Other factors that can affect operator vision include, but may not be limited to:

- Acceleration
- Darkness
- Fog
- Interior Lights
- Load Distribution
- Obstruction in Field of Vision
- Propulsion-Engine Trim Angles
- Rain and Weather
- Speed
- Obstruction in Field of Vision

Boating Regulations and Requirements

In the United States, Federal law mandates that as the owner/operator you have a responsibility to yourself and your passengers to always operate your vessel in a safe manner. As the owner/operator, you should always check the regulatory procedures and/or requirements for the country of registration as regulations and responsibilities may changed from country to country.

As the owner/operator, you are responsible for any documentation or registration required. All undocumented vessels equipped with propulsion machinery must be registered in the State or country of principal use. A certificate of number is issued upon registering the vessel. These numbers must be displayed on your vessel. The owner/operator of a vessel must carry a valid certificate whenever the vessel is in use. In the United States if the vessel is moved to a new State of principal use, the certificate is valid for 60 days.

Some states require all vessels to be numbered. Requirements in other countries may vary.

Some vessels may be documented. The certificate of documentation MUST be on board a documented vessel at all times.

U.S. Coast Guard Boating Safety

.Please forward any non-technical questions, concerns or suggestions to the following address for information regarding:

- Information on boating safety recalls.
- To comment on U.S.C.G. boarding procedures.
- For answers to boating safety questions and for boating safety literature.

Commandant (CG-5422)
U.S. Coast Guard Headquarters
2100 Second St. SW Stop 7581
Washington, DC 20593-7581
www.uscgboating.org

Supplemental Federal, State or Local Regulations

It is the owner/operator's responsibility to be aware of any other Federal, State or local regulations that may be in effect. Examples include, but are not limited to:

Discharge of Oil

The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon or discoloration of the surface of the water or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $5000.

Solid Waste Disposal

(Marpol Treaty) The Act to Prevent Pollution from Ships places limitations on the discharge of garbage from vessels. It is illegal to dump plastic trash anywhere in the ocean or navigable waters of the United States, including the Great Lakes. The discharge of other types of garbage is permitted outside of specific distance offshore as determined by the nature of that garbage.

See ***Federal Requirements and Safety Tips for Recreational Boats*** for more detail.

Other Waste

The Refuse Act of 1899 prohibits throwing discharging or depositing any refuse matter of any kind (including trash, garbage, oil and other liquid pollutants) into the waters of the United States.

Marine Sanitation

All recreational boats with installed toilet facilities must have an operable marine sanitation device (MSD) aboard. vessels 65 feet and under may use a Type I, II, or III MSD. All installed MSD's must be Coast Guard certified. The Holding Tank installed in the Chris Craft is certified by definition under the regulations and is not specifically labeled.

Speed

Local speed laws are often posted to prevent wake damage to shore side facilities, to slow boaters in crowded or confined situations, and to preserve wildlife and wildlife habitats. Penalties for violations are often very high.

Wake

No wake zones are usually posted to prevent damage to shore side facilities. It is the operator's responsibility to operate the boat at a speed that does not produce a damaging wake, even if the speed is below a posted speed limit.

Alcohol and Drugs

Operating your Chris-Craft under the influence of alcohol and/or drugs may cause serious injury. Do not drink alcohol and/or take drugs and operate the vessel.

It is the responsibility of the owner/operator to ensure that the vessel operator is not under the influence of drugs and/or alcohol. In the United States, boating while intoxicated (BWI) became a Federal offense January13, 1988. If the Blood Alcohol Content (BAC) is 0.10% (0.08% in some States) or higher for operators of recreational vessels being used only for pleasure, violators are subject to a civil penalty not to exceed $1000 or criminal penalty not to exceed $5000 or both. Other State or local penalties may apply.

Accident Reporting

In the United States, all boating accidents must be reported by the operator or owner of the vessel to the proper marine law enforcement authority for the State in which the accident occurred.

Accidents involving more then $500 damage or complete loss of the vessel must have a formal report filed within 10 days. Accidents involving death or disappearance must be reported immediately. Accidents involving injury requiring more than first aid must have a report filed within 48 hours.

If you need further information regarding accident reporting, please contact:

United States Coast Guard Boating Safety
Commandant (CG-5422)
U.S. Coast Guard Headquarters
2100 Second St. SW Stop 7581
Washington, DC 20593-7581
www.uscgboating.org

It is the owner/operator's responsibility to determine the regulations in effect in areas outside the United States.

Rendering Assistance

The master or person in charge of a vessel is obligated by law to provide assistance that can be safely provided to any individual or vessel in distress, as long as his vessel is not endangered in the process. The master or person in charge is subject to a fine and/or imprisonment for failure to do so (CFR Title 46).

Vessel Maintenance

As the owner/operator, you are responsible for keeping your vessel in a safe operating condition. Regularly scheduled maintenance is mandatory for this to occur.

Load Capacity

Loading and capacity refers to the weight of:

- People
- Fuel
- Gear
- Any item carried aboard the boat.

When loading the boat keep the following in mind:

- Overloading violates existing regulations. NEVER carry more weight than authorized for the class of boat.
- Improper loading and/or distribution of weight is a significant cause of accidents.

Capacity limits and weight distribution apply to moderate weather conditions. If the weather changes and seas become rough, the load distribution of the boat will affect its handling characteristics.

For additional information on load capacities and weight distribution, refer to a good boating course and/or the U.S. Coast Guard.

As the owner/operator, you are
Responsible for the safe loading
and weight distribution of your boat.

Safety Equipment

In the United States the operator of a vessel is responsible for the minimum safety equipment required by the U.S. Coast Guard. Safety equipment should be maintained on a regular basis and must be stowed where it is accessible in a reasonable amount of time in an emergency. Some safety equipment must be Coast Guard approved. “Coast Guard Approved Equipment” has been determined to be in compliance with USCG specifications and regulations relating to performance, construction or materials.

As the owner/operator, you should always check the safety procedures and/or requirements for the country of registration as regulations and responsibilities may changed from country to country.

A complete list of required equipment, Federal rules and regulations and other valuable links can be found on the ***United States Coast Guard Boating Safety*** web page: **www.uscgboating.org**

A Quick Reference Chart of the Federal Requirements for recreational boats can be found at: **http://www.uscgboating.org/safety/fedreqs/equ_refchart.htm**

Read and understand all pamphlets and brochures supplied with safety equipment. Become familiar with how the equipment operates and stow all safety equipment properly.
At a minimum you should have the following safety equipment available (Table 2-1):

Table 2-1. Minimum Required Safety Equipment

Vessel Length (in Feet)		Equipment	Requirement
16–25	26–39		
✓	✓	Life Jackets (PFDs)	(a) One Type I, II, III, or V wearable PFD for each person on board. (USCG approved)
✓	✓		(b) In addition to paragraph (a), must carry One Type IV (throwable) PFD.
		Visual Distress Signal (VDS)	(a) One electric distress light or Three combination (day/night) red flares. (Note: only required to be carried on board when operating between sunset and sunrise.)
✓	✓		(b) One orange distress flag and One electric distress light - or -Three hand-held or floating orange smoke signals and One electric distress light - or - Three combination (day/night) red flares: hand-held, meteor or parachute type.
✓		Fire Extinguishers	(a) One B-I (when enclosed compartment)
	✓		(b) One B-II or Two B-I. (Note: Fixed system equals One B-I.)
			(c) One B-II and One B-I or Three B-I. (Note: Fixed system equals One B-I or Two B-II.)
✓	✓	Backfire Flame Arrestor	Required on all gasoline engines except outboard motors.
✓	✓	Navigation Lights	Required to be displayed from sunset to sunrise and in or near areas of reduced visibility.

Table courtesy of the U.S. Coast Guard.

Personal Flotation Devices (PFDs)

Federal regulations require that you have at least one Coast Guard-approved Personal Flotation Device (PFD) for each occupant in a recreational boat. All PFDs must be in serviceable condition, readily accessible, and legibly marked with the Coast Guard approval number. Each PFD must be of the appropriate type and size for each individual occupying the boat.

The Coast Guard recommends, and many states require, wearing the appropriate PFD when:

- Water-skiing and other towed activities.
- While operating personal watercraft (PWC).
- During white water boating activities.
- While sail boarding (under Federal law sail boards are not boats).

Laws governing the use of a particular type of PFD for a particular activity varies from state to state. Some states require that children wear a PFD at all times. For clarification on any state requirement, check with the state boating safety officials.

There are three kinds of PFDs: Foam, Inflatable, and Hybrid.

Within these three kinds there are five classes, known as Types, of PFDs, four wearable and one throwable. Only Type I is designed to turn an unconscious person's face upward, out of the water.

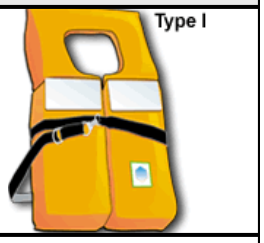
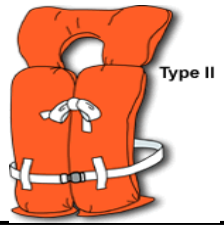
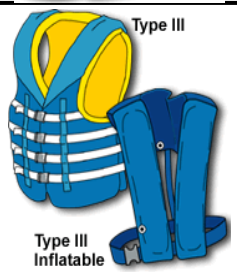
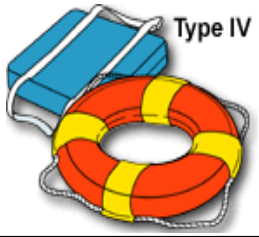
The best PFD is the one that you wear.

When boating always wear your PFD.

Types of PFDs

There are five types of PFDs:

Table 2-2. Types of PFDs

Type	Description	Illustration
I	**Offshore:** Provides most buoyancy. Designed for remote or rough waters where rescue may take awhile. Keeps head out of water in face-up position. Comes in two sizes: adult and child.	
II	**Near-Shore:** Intended for calm and inland waters where rescue may be quick. May turn unconscious wearer face-up. Not as efficient as Type I.	
III	**Flotation Aids:** Vest or full-sleeved jacket style. Intended for calm waters. Not recommended for rough waters as they may not keep individual face-up. Generally used for water sports. Most comfortable for continuous wear. Some Type III's will inflate when you enter the water.	
IV	**Throwable Devices:** Cushion, horseshoe, or ring buoy style. Designed to be thrown to someone in the water. Not designed as a personal flotation device that can be constantly worn. Should be attached to a polypropylene rope. For emergency use only.	
V	**Special Use Device:** Designed for specific activities such as kayaking or water skiing. Varieties include deck suits, work vests, board sailing vests, and hybrid types. If counted as a minimum PFD requirement, it must be worn and used in accordance with their label. **Hybrid Inflatable:** Least bulky of all PFD types. Has both foam and an inflatable chamber. Performance equal to Type I, II, or III PFDs when inflated. To be acceptable hybrid PFDs must be worn when underway.	

Foam Class PFDs

Foam type PFDs are inherently buoyant and are used for:

- Adult, Youth, Child, and Infants
- Swimmers, poor swimmers, and non-swimmers

Table 2-3. PFD Minimum Buoyancy Requirements – Foam

Wearable Size	Type	Inherent Buoyancy (Foam)
Adult	**I** **II & III** **V**	**22 pounds** **15.5 pounds** **15.5 to 22 pounds**
Youth	**II & III** **V**	**11 pounds** **11 to 15.5 pounds**
Child and Infant	**II**	**Inher7 pounds**
Throwable: Cushion Ring Buoy	**IV**	**20 pounds** **16.5 & 32 pounds**
The throwable PFD is only available in the Foam Class.		

Inflatable Class PFDs

The inflatable PFD may be more comfortable to wear but may not be used by children under 16 years of age. Each inflatable PFD must have an operational gas cylinder and the individual must be knowledge-able in its use and the condition of the PFD. Inflatable PFDs may not satisfy the requirement to carry PFDs, as established by Federal Regulations

Table 2-4. PFD Minimum Buoyancy Requirements – Inflatable

Wearable Size	Type	Inherent Buoyancy (Inflatable)
Adult	**I & II** **III** **V**	**34 pounds** **22.5 pounds** **22.5 to 34 pounds**

Hybrid Class PFDs

Hybrid PFDs are both foam filled and are inflatable.

Table 2-5. PFD Minimum Buoyancy Requirements – Hybrid

Wearable Size	Type	Inherent Buoyancy	Inflated Total Buoyancy
Adult	**III & III** **V**	**10 pounds** **7.5 pounds**	**22 pounds** **22 pounds**
Youth	**II & III** **V**	**9 pounds** **7.5 pounds**	**15 pounds** **15 pounds**
Child	**II**	**7 pounds**	**12pounds**

PFD Considerations

To obtain the best benefit from a PFD:

- Children, non and poor swimmers should wear a PFD at all times.
- Keep all PFDs in an accessible location.
- Ensure the PFD comfortably fits the individual, both in and out of the water.
- Practice using the PFD in the water. This will provide insight and confidence in its use.
- Teach all children how to put on and wear the PFD.

PFD Care:

- Do not store in plastic bags, locked in a compartment, or stowed beneath other gear.
- Do not store when wet. Allow to dry thoroughly. Do not use a radiator or heater to dry.
- Store in a well-ventilated area.
- Keep PFDs away from sharp objects. Do not puncture.
- Inspect on a regular basis. Replace any damaged PFD. Ensure inflatable PFDs have no leaks.

The best PFD is the one that you wear.

When boating always wear your PFD

Additional Equipment

Safety equipment recommended by the Coast Guard should be considered the absolute minimum requirements. Your inventory of safety related devices depends on where you operate your boat and your personal desired degree of self-sufficiency. Other equipment to consider includes, but is not limited to:

- Anchor and Sea Anchor
- Binoculars
- Boat hook
- Emergency Position Indicating Radio beacon (EPIRB)
- Extra clothing
- First Aid Kit
- Flashlights
- Food and water
- Hand Pump
- Spare Fuel
- Sunglasses
- Throwable device
- Tool kit
- VHF Radio
- Visual Distress Signals
- Whistle or bell (sound device)

Tools:

- Adjustable wrench
- Duct tape
- Electricians' tape
- Hammer
- Jackknife/Pocket knife
- Lubricating oil
- Pliers (various types)
- Prop wrench
- Screwdrivers (various sizes)
- Spark plug wrench

Spare Parts:

- Extra bulbs
- Extra drain plug
- Extra fuses
- Extra prop nut/washer
- Spare propeller
- Spare wire
- Spark plugs

Visual Distress Signals

As the owner/operator, you are responsible for any visual distress requirements (signals) that you may be required to carry. It is the owner/operator's responsibility to provide proper storage, understand how to handle, and know how to dispose of these devices. These requirements can be found at: **http://www.uscgboating.org/safety/fedreqs/equ_vds.htm**

There are two types of Visual Distress Signals in use:

- Pyrotechnic type
- Non-Pyrotechnic type

Table 2-6 lists the types of Visual Distress Signals available which are **Coast Guard approved**.

Table 2-6. Visual Distress Signals

Pyrotechnic Visual Distress Signals		
Description	**Use**	**CG Approval Number**
Hand-Held Flare	Day/Night	160.021
Floating Orange Smoke	Day Only	160.022
Pistol Parachute Red Flare	Day/Night	160.024
Hand-Held Parachute Red Flare	Day/Night	160.036
Hand-Held Orange Smoke	Day Only	160.037
Floating Orange Smoke	Day Only	160.057
Red Aerial Pyrotechnic Flare	Day/Night	160.066
Non-Pyrotechnic Visual Distress Signals		
Distress Flag	Day Only	160.072
Electric SOS Distress Light	Night Only	161.013

Storage

Store all VDS devices in a cool, dry place. Ensure they are protected from children, rain, sea spray, and high humidity. By law these devices must be readily accessible, where they can be reach quickly regardless of the operating conditions.

Disposal

Pyrotechnics are valid for 42 months from date of manufacture. Each pyrotechnic has a date stamp indicating its expiration date. Any VDS that is damaged or wet may not perform in the intended manner, posing a hazard to the user and must be disposed of. To dispose of expired or damaged pyrotechnics, contact the nearest law enforcement agency or fire department.

Emergencies

As the owner/operator of your vessel, you are responsible to know how to react to various emergencies. This section lists a few of the emergencies you may come across, but is not all-inclusive of the type of incidents you may encounter.

Medical

Medical emergencies, both major and minor, are rare among boaters but they do occur, and help is not always immediately available. Depending upon your situation and circumstances, at least two people should be CPR certified and have taken a first aid course. Your vessel should also be equipped with a quality first aid kit.

Some of the major medical emergencies you could encounter consist of, but are not limited to:

- Drowning
- Near drowning
- Hypothermia
- Carbon Monoxide poisoning
- Trauma from falling

Some of the minor emergencies you could encounter consist of, but are not limited to:

- Seasickness
- Heat illness
- Sunburns
- Skin burns (touching hot machinery)
- Minor fall (bruises, tissue injury)

Use caution when swimming where jellyfish are in concentration. Never swim where sewage contamination exists.

Getting Help

When at sea do not expect to receive help immediately if you have a medical emergency. You must rely upon yourself and your ability. Be prepared. Obtain and keep aboard, a good, quality book on first aid. Obtain basic first aid skills. Learning CPR is always a good idea for both sea and shore activities. CPR courses are available at your local school, hospital or Red Cross.

Being prepared for medical emergencies is always the best course of action to take.

Carbon Monoxide

Carbon Monoxide is an odorless, colorless, tasteless gas. Carbon Monoxide can kill you. Ensure there is adequate ventilation when running engines, generators, and other fuel burning equipment. When the vessel is docked, anchored, or moored, open all doors, windows, and hatches to distribute fresh air and provide adequate air circulation. If Carbon Monoxide poisoning is suspected, obtain medical attention immediately.

Carbon Monoxide (CO) is produced when a carbon-based fuel – gasoline, diesel, propane, charcoal, oil, etc. – burns. On a boat, sources of CO may include, but is not limited to:

- Engines
- Barbecues
- Boats moored or tied up near by
- Generators
- Portable space heaters

It is the owner/operator's responsibility to recognize CO poisoning. Symptoms include, but may not be limited to:

- Engines
- Barbecues
- Dizziness
- Irritated eyes
- Headaches
- Generators
- Portable space heaters
- Weakness
- Ears ringing
- Nausea
- **Unconsciousness**

Early symptoms of CO poisoning are often confused with seasickness or intoxication, thus those individuals affected may not receive adequate medical attention. As the owner/operator, you must be aware of Carbon Monoxide concentrations and its effects on passengers and crew. Dangerous concentrations of Carbon Monoxide may be present if:

- There is leakage in the engine exhaust system.
- There is leakage in a generator exhaust system.
- There is insufficient fresh air circulation.
- Fumes move from the aft section of the vessel into the cabin and cockpit area.
- Exhaust gas becomes trapped in enclosed places.
- Exhaust outlets become blocked.
- A back draft or “station wagon effect” occurs.
- Your vessel is situated next to, and receives exhaust from, the neighboring vessel.
- Your vessel is slow, idling, or stopped.

Carbon Monoxide is colorless, odorless, and tasteless.
To protect yourself and passengers from CO poisoning:

- Maintain sufficient ventilation at all times.
- Operate all fuel-burning appliances in a location where fresh air can circulate.
- Keep all passengers away from exhaust outlets.
- If fumes are detected, CO is present. Take steps to ventilate the area.
- Symptoms of seasickness could be CO poisoning. Get the affected person to fresh air. Seek medical attention, unless you are positive it is NOT Carbon Monoxide poisoning.
- Review the Coast Guard pamphlet included with this documentation.
- Get a vessel safety check.

Current and archived carbon monoxide alerts may be found at:

http://www.uscgboating.org/safety/carbon_monoxide.aspx

Man Overboard

If a person falls overboard, you may have only minutes to perform a successful rescue.

This manual cannot address every man overboard situation, therefore it is incumbent upon the owner/ operator to learn man overboard rescue techniques. Practicing man overboard techniques is an excellent way to prepare for an actual emergency.

Water temperature is a major component in a rescue attempt due to the danger of hypothermia. If the water temperature is below 21° C (70° F), hypothermia can quickly set in, incapacitate, and kill an individual. Cold water removes body heat 25 times faster than air, therefore it is imperative to rescue the victim as quickly as possible.

Water rescue consists of three phases:

- Returning to the victim
- Making contact with the victim
- Getting the victim back aboard the vessel

If an individual falls overboard it is imperative to locate and return to the victim. If at night, use all available light sources to locate the individual. Locating and returning to the individual include, but may not be limited to:

1. Make everyone aware of the incident.
2. Visually locate and keep the victim in sight.
3. Slow the vessel when heading towards the victim.
4. When in range, throw a life preserver, even if the victim is wearing a flotation device. This provides and serves as another marker.

Employ the following steps when making contact with the victim:

1. Use a circling procedure and attempt the approach by heading into the wind or into the waves. This allows the victim to drift towards the boat.
2. Maintain a constant visual of the victim.
3. When close to the victim, alongside, stop the engine and place in gear to prevent the propeller from wind-milling.

Do not enter the water except as a last resort. If you must enter the water, ensure you wear a personal flotation device (PFD) and a safety line attached to the vessel. Use extra protection/precautions if the water temperature is cold.

When retrieving the victim:

- Attempt to reach the victim with a pole, rope, or life preserver.
- Help the individual back into the vessel.
- It is very difficult to pull a victim back into the boat via the sides. The most effective recovery is at the swim platform located at the stern.
- If the person is injured, going into the water may be the only recourse. Wear a personal flotation device (PFD) and attach yourself to the vessel with a rope.
- Handle the victim with care. Be aware of spinal injuries.
- If required, treat the victim for hypothermia.
- If required, obtain medical attention as rapidly as possible.

Fire

When fighting fires:

- Activate Fireboy System if there is a fire in the engine room.
- If possible, throw burning materials over the side.
- Never use water, or water-type extinguishers on gasoline, oil, grease, or electrical fire. Water spreads the flames and acts as a conductor for electricity.
- Pull the safety pin and aim the fire extinguisher at the base of the flames. Squeeze the handle and use a left-to-right sweeping motion to extinguish the flames.
- Signal for help using an appropriate signaling device.
- If required, abandon ship, but only as a last resort.

To help reduce the possibility of fire, store flammable materials in an approved shipboard storage container.

Classes of Fires

In the United States there are four classes of fire of which you should be familiar with. They are:

- **Class A** – Wood, paper, textiles, trash, and other ordinary combustibles
- **Class B** – Flammable liquids, oils, solvents, paints, grease, fuels, etc.
- **Class C** – Electrical, energized electrical equipment
- **Class D** – Combustible metals (magnesium, titanium, potassium, etc.)

NOTICE

Dry Powder type extinguishers are used on Class D (combustible metals) type fires. This type of fire is rare on a boat of this type and therefore not discussed.

Compliant Fire Extinguishers

Fire fighting extinguishers have been developed to combat the various classes of fires. These are:

- Water
- Carbon Dioxide
- Multipurpose Dry Chemical
- Foam

Some extinguishers are classified as multipurpose, meaning they can be used on more than one type of fire. For this reason you should equip the vessel with at least two different types of fire extinguishers, one for general purpose (such as Carbon Dioxide) and another for fuel (such as Multipurpose Dry Chemical or Foam). Table 2-7 indicates which type of extinguisher works best for which class of fire.

Table 2-7. Class of Fire and Extinguisher Types

Class of Fire	Extinguisher Type			
	Water	Carbon Dioxide	Multipurpose Dry Chemical	Foam
A	**Best**	**Good**	**Good**	**Good**
B		**Good**	**Best**	**Best**
C		**Best**		

It is essential that you have, maintain, and regularly inspect fire extinguishers. As the owner/operator, it is imperative that you learn the differences between the different types of fires that can occur aboard your boat. With this knowledge you can quickly extinguish fires with the proper type of fire extinguisher.

Required Number of Portable Fire Extinguishers

The overall length of the boat determines the minimum number of portable fire extinguishers required. Also, vessels with an approved fixed fire fighting system require fewer extinguishers, as explained in Table 2-8.

Table 2-8. Minimum Portable Fire Extinguishers Required

Vessel Length	No Fixed System (Quantity and Type)	With Approved Fixed System (Quantity and Type)
Less than 7.9m (26 ft)	**(1) B-I**	**0**
7.9m (26 ft) to less than 12.2m (40 ft)	**(2) B-I or (1) B-II**	**(1) B-I**

Fire Extinguisher Maintenance and Service

The boat owner/operator shall:

- Have fire-fighting equipment checked at the intervals indicated on the equipment.
- Replace portable fire extinguishers, if expired or discharged, by devices of identical fire fighting capacity.
- Have fixed system systems refilled or replaced when expired or discharged.

Any fire extinguisher that does not satisfy the maintenance requirements must be replaced, or recharged. If recharging a fire extinguisher, be sure to use a qualified fire extinguisher servicing company.

NOTICE: When the Fireboy system is activated the engine and the blower will be shut down automatically.

NOTICE:

Check the indicator lamp.

- The indicator lamp is designed to monitor the state of the fire extinguisher when the ignition key is **ON**.
- A **GLOWING GREEN** light indicates the system is **CHARGED**.
- A **NON-GLOWING GREEN LIGHT** indicates the system is **DISCHARGED**.

The engine compartment blowers are required to have a ground connection to be connected to the Fireboy system. **Failure to connect a power ventilation system impedes the operation of the fire extinguisher and may prevent fire extinguishment.**

CAUTION: With the "S" hook in place, and the cable end retaining clip **NOT** installed, any pull on the cable exceeding 20 pounds will actuate the release mechanism. The cable should never be installed or removed without the cylinder securely fastened in its mounting brackets.

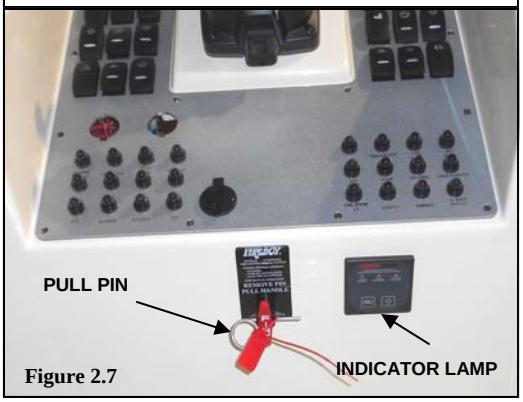


Figure 2.7

Figure 2.6

Operation of the Fireboy Fire Extinguisher

- Automatic actuation of a Fireboy fire extinguisher occurs at 175 degrees F. and is entirely dependent on the intensity of the fire.
- Signs of actuation:
  1. A loud sound similar to small arms fire.
  2. A loud sound of rushing air.
  3. An extinguished indicator lamp.
  4. A stalled engine.
- When Actuation occurs:
  1. Immediately shutdown all engines, powered ventilation, and electrical systems.
  2. Do not open the engine compartment.
- After actuation occurs:
  1. Before inspecting for damage, allow the agent to "soak" the compartment for at least 15 minutes and wait for hot metals or fuels to cool.
  2. Have approved portable extinguishers in hand and ready for use.
  3. Do not breathe fumes or vapors caused by the fire. They are hazardous and toxic.

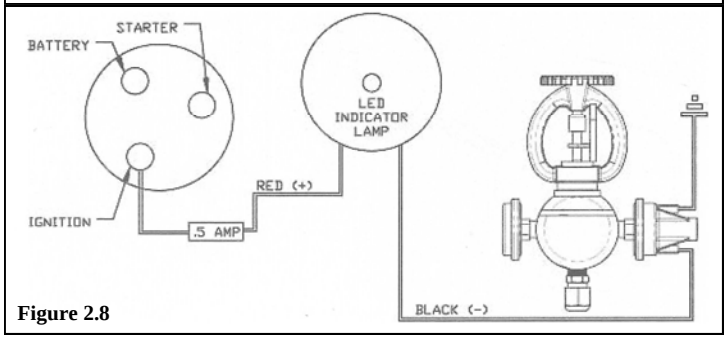


Figure 2.8

Safety at Sea

Hitting underwater objects, or boating in dangerous conditions can cause serious injury or death. Always know where you are going, where the hazards are, and avoid them. If you find yourself in uncharted waters, boat very slowly and post a lookout.

As the owner/operator, it is your responsibility to know where obstructions are, recognize shallow water, and avoid unnavigable conditions such as dangerous currents. To achieve this you must be familiar with, and know how to read, nautical charts. Nautical charts, and navigation data, are available from the National Oceanic and Atmospheric Administration. (NOAA – web address: **www.noaa.gov**).

As the owner/operator, you must observe and understand all navigational aids, be aware of tide times (where appropriate), and acquaint yourself with new technologies that can help you navigate your vessel safely.

If you find yourself in unfamiliar waters, and without knowledge of the hazards, proceed slowly and post a lookout – someone to watch for hazards.

Mechanical Failures

If your vessel breaks down due to mechanical failure, perform the following procedures:

1. If necessary, set the anchor or sea anchor to avoid drifting.
2. Investigate and troubleshoot the cause of the breakdown.
3. If available, refer to the specific systems manual for additional information.
4. If possible, correct the problem.
5. If necessary, seek assistance from any nearby vessels and/or signal for help using an appropriate signaling device.

If you experience propulsion failure some items you may initially investigate are (not all inclusive):

1. Check fuel level.
2. Check for clogged fuel filters.
3. Check for a plugged tank vent.
4. Check for obstructions in the fuel lines.

Shallow Water Dangers

The minimum depth of water you are able to run your boat is determined by several factors. The draft is affected by the loading of the boat including the fore and aft trim, the propeller size and even by the salinity of the water. When your boat is fully loaded, measure the maximum depth from the waterline to the deepest point and note the number. It is the owner/operator's responsibility to maintain a comfortable margin over the bottom.

Should you run aground, visually check for water intrusion. If serious damage has occurred, it may be prudent to stay aground until the damage can be assessed and controlled. After re-floating, check the running gear for damage and feel for any unusual vibration. Perform a thorough inspection after trailering the boat.

Running Aground

NOTICE

Engine cooling intakes are located under the boat. Ensure intakes are free and clear of debris. Do not start the engines if intakes are plugged.

If you encounter shallow water and run aground:

1. Immediately place the transmissions in neutral.
2. Ensure everyone has, and is wearing, a PFD.
3. Perform a head count. Confirm everyone is present and accounted for.
4. If possible, inspect the hull, propulsion, and steering systems for damage.
5. Inspect for flooding and/or leaks.
6. If the vessel is undamaged, decide on an appropriate course of action:
   – Determine the water depth and the type of obstruction you are lodged on: sand, mud, rock, etc.
   – Is it possible to dislodge the vessel?
   – Do you need to lighten the load by removing passengers or equipment?
   – Is it possible to push the vessel off the obstruction?
   – Is it possible to use reverse thrust to free the craft?
   – Determine tide, current, and wind velocity. Will they help or hurt your situation?
7. If necessary, seek assistance from any nearby vessels and/or signal for help using an appropriate signaling device.
8. If damaged it may be safer to leave the vessel aground and seek professional help.

Flooding, Sinking, and Capsizing

If the vessel encounters flooding, swamping, or is in danger of capsizing you should, as a general measure:

1. Ensure everyone has, and is wearing, a PFD.
2. Perform a head count. Confirm everyone is present and accounted for.
3. Seek assistance from any nearby vessels.

If your vessel encounters flooding and/or hull leaks, in addition to the general measures:

1. Bring the boat to a complete stop.
2. Identify the source of the leak/flooding.
3. If possible stop or reduce leaking by using plugs, a hull patch kit, towels, rags, or any other available material.
4. Engage the bilge pumps.
5. Assist the bilge pumps by removing the water with buckets or some other suitable device.
6. Abandon the vessel only as a last resort.

If the boat is in danger of capsizing, or has capsized, in addition to the general measures:

1. If you are far from shore and the vessel is not fully submerged, stay with it.
2. Climb onto the overturned hull to remove you and your passengers from the water. This helps you retain body heat and reduces the possibility of hypothermia.
3. Signal for help with an appropriate signaling device

.

Collisions

If your vessel is involved in a collision and depending upon the severity of the collision, perform the following tasks:

- Ensure everyone has, and is wearing, a PFD.
- Perform a head count. Confirm everyone is present and accounted for.
- If injuries have occurred render appropriate first aid.
- Inspect the boat for damage, flooding, and/or leakage. If necessary engage the bilge pumps.
- Attempt to stop any leaks by using plugs, a hull patch kit, towels, rags, or other available material.
- If necessary, seek assistance from any nearby vessels and/or signal for help using an appropriate signaling device.

If you are involved in a collision, you are required to file an accident report. Contact the nearest state enforcement agency or Coast Guard office. If boating outside territorial waters, consult the nation you are visiting for accident reporting requirements.

Lightning Precautions

A vessel at sea may be susceptible to lightning strikes. If the vessel is struck by lightning check for injuries and apply any first aid as may be required.

Also:

- Check all electrical components, including compasses to determine if damage or a change in calibration has occurred.
- Check the vessel for physical damage, system integrity, and continuity to ground.

If caught in a lightning storm, the **minimum** precautions that shall be applied are:

- All occupants shall remain inside the boat.
- Occupants shall not enter the water. Arms and legs shall not dangle in the water.
- Occupants shall refrain from making contact with components in such a way as to become an electrical bridge between such items.
- Avoid contact with any metal components that could conduct electrical current.

It is the owner/operator’s responsibility to become familiar with the dangers of lightning and learn all the precautions necessary to protect the crew, passengers, and vessel in the event of a lightning storm.

Fueling

Gasoline is very flammable and explosive. The precautions and Procedures in this section are the minimum steps that should be Carefully and fully observed each time the boat is fueled.

Always follow the manufacturer's recommendations for grades of fuel and oil used in your engine. Using improper products may cause damage to the engine and void your warranty.

General Procedures:

- NEVER smoke or use any flame or ignition device when fueling or around fuel.
- If possible, always fuel during daylight hours.
- Always use fresh fuel. Old fuel can form gum and varnish which may affect engine performance.
- Keep a fire extinguisher nearby.
- All persons not directly involved with the fuel operation should stand clear.
- Ensure engines are stopped and all electrical equipment turned OFF.
- If appropriate, close all hatches, ports, doors, and windows to prevent fumes from entering the cabin.

Think! Have an escape route planned before fueling.

Fueling the boat:

1. Remove the deck plate.
2. Keep the nozzle in contact with the grounded deck plate while filling. This helps prevent static electricity from creating sparks.
3. Do not over fill. Fuel flowing from the fuel tank vent may spill overboard. Fuel spills violate government regulations and may result in citations. Allow for fuel expansion.
4. NEVER leave the boat during the fueling process.

After fueling:

1. Replace the fuel deck plate. Make sure the cap is tight to prevent water from leaking into the fuel tank.
2. Wipe up any spilled fuel on the deck and surrounding area. Dispose of rags properly.
3. If appropriate, open any hatches, ports, doors, and windows to ventilate the cabin.
4. Investigate for leaks and drips. Make any corrections necessary.

NOTICE

The fuel deck plate cap is fitted with an O-ring that over time may become worn and/or damaged. Inspect the cap on a regular basis and replace as necessary.

Figure 2.9

Operate the blower as required by law.

CHAPTER 3

Systems

There are several systems and components associated with your Chris-Craft. This chapter provides an overview and functional description of these systems. However, it is not, nor intended to be, a replacement or substitute for the component manuals that accompany your boat.

At the time of this writing, the information contained in this chapter is current and up to date. However, specifications are subject to change without notice. If there is a discrepancy between the information in this chapter and a component manual, the component manual takes precedence.

It is the owner/operator's responsibility to remain current on any changes that may affect the operation and safety of the boat.

Switch Identification

There are numerous switches you should be aware of when operating your boat. This section identifies these switches by their icon.

Table 3-1. Switch Identification Icons

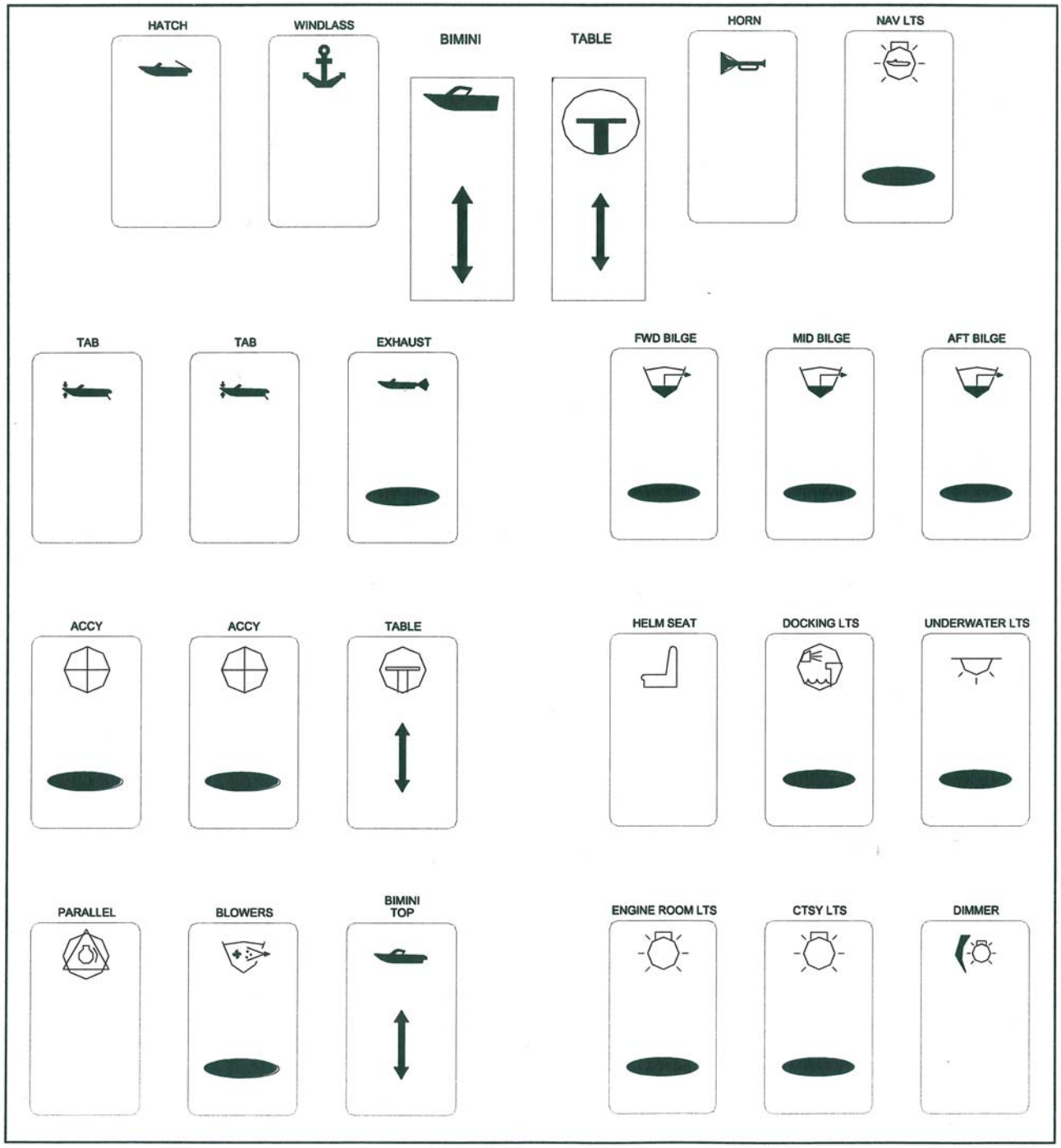


Figure 3-1. Helm Switch Panel

ICON	DESCRIPTION	SIZE	ICON	DESCRIPTION	SIZE
12V	12 VOLT OUTLET	15 AMPS		WINDLASS	3 AMPS
	SELECTABLE EXHAUST (OPTION)	5 AMPS		HORN	10 AMPS
	TRIM TABS	20 AMPS		ENGINE HATCH SOLENOID	3 AMPS
	IGNITION SWITCH (PORT/STBD)	10 AMPS		ENGINE ROOM LIGHTS	5 AMPS
	BLOWERS (PORT/STBD)	10 AMPS		COURTESY LIGHTS	5 AMPS
	MANUAL BILGE PUMP (FWD/MID/AFT)	15 AMPS		DIMMER	3 AMPS
	HELM SEAT (OPTION	15 AMPS		NAVIGATION/ANCHOR LIGHT	10 AMPS
	TABLE LIFT	10 AMPS		BIMINI LIFT	15 AMPS
	HARD TOP SUN SHADE	5 AMPS		HARD TOP SUN ROOF	10 AMPS
	HARD TOP WINDSHIELD WASHER	10 AMPS		HARD TOP WINDSHIELD WIPER	5 AMPS
	UNDERWATER LIGHTS	5 AMPS		PARALLEL SWITCH	N/A

Engine Compartment

The engine compartment normally contains the following components:

- Engine (s)
- Batteries
- Trim Tab Pump
- Engine Trim Pump
- Bilge Pump (s)
- Outdrive
- Generator
- Water Heater
- Fuel Tanks
- Fuel Valves
- Waste Tank

Other components may be included within the engine compartment depending upon options chosen.

The engine compartment is accessed via the engine hatch (Figure 3-3) located at the stern of the boat. The hatch is lifted by either a single or dual electric power lift, which is activated from the helm (Figure 3-2).

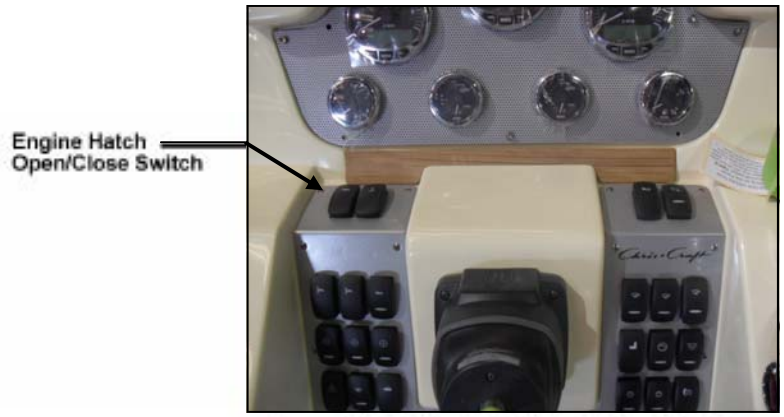


Figure 3-2. Engine Hatch Activation Switch

Figure 3-3. Engine Hatch

Boat Systems

NOTICE

Most of the systems discussed are common to the boats covered in this manual. Where major differences occur between models those differences are highlighted.

The systems/components discussed in this chapter are:

- Safety System
- Seacocks and Thru-Hulls
- Bilge Pumps
- Fuel Systems
- Steering Systems
- Engines
- Control Throttles/Shifts
- Trim Tabs
- Fresh Water System
- Marine Sanitation System
- Electrical System
- Compass
- Entertainment and Convenience Equipment

Safety System

CAUTION

Never restart the engine should a fire occur. Correct the malfunction that caused the fire and replace the fire bottle before you use the boat again.

The safety system includes the Automatic Fire Extinguisher Indicator (Figure 3-4) and an engine compartment fire extinguisher. Work with your dealer to become familiar with the operation of the system.

The engine alarm monitors the engine compartment for fire. The location of the engine compartment fire is located near the helm instrument panel.

Should an engine fire occur, the fire bottle automatically discharges.

Figure 3-4. Fire Alarm Monitor

The fire extinguishing agent used is as follows:

- For Domestic And International Use: HFC - 227.

You should frequently check the fire extinguisher for the correct pressure. If the pressure is below specification, have the unit serviced.

You should also weigh the cylinder (less the bracket) for proper weight. If the gross weight has deviated from the specification label, service or replace the fire bottle. Weigh the cylinder at least twice a year.

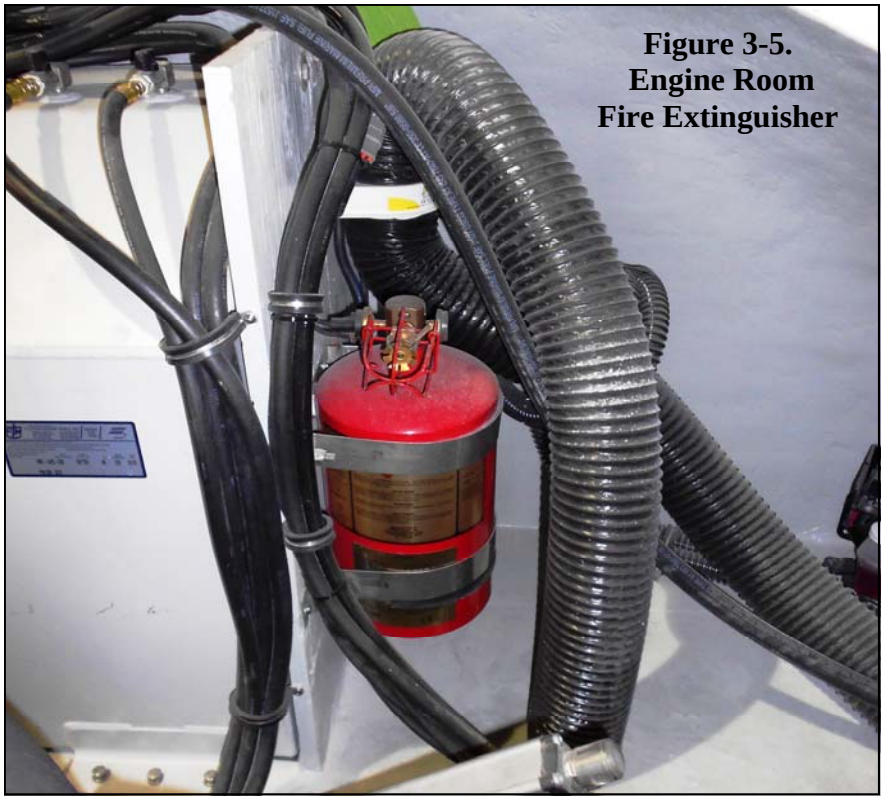


Figure 3-5. Engine Room Fire Extinguisher

Seacocks and Thru-Hulls

Each boat has thru-hulls associated with it. Depending upon the model and engine configuration of your boat, it may also include one or more seacocks which allows for raw water engine cooling.

The appendix provides CAD drawings for each boat model, including seacock and thru-hull locations. It is your responsibility to become familiar with those drawings appropriate for your boat.

Most seacocks are equipped with a shut-off feature, normally in the form of a ball-valve. Each seacock should be exercised periodically to ensure proper function and to prevent corrosion accumulation.

A seawater strainer, attached to the seacock, protects the system from foreign objects that may enter the seacock. The strainer should be periodically cleaned and inspected for effective operation.

Drain Plugs

CAUTION

Ensure you re-install the drain plug BEFORE putting the boat back into the water.
Failure to do so will result in flooding of the engine compartment.

Garboard Drain plugs (Figure 3-6) allows water to drain from the boat when trailered. After the boat is pulled from the water, open the drain plug so as to allow accumulated water to drain. When feasible, and if applicable, rinse the area with fresh water to prevent salt buildup and corrosion.

If the boat will not be operated for more than a month, the engine should be prepared for extended storage as outlined in the Owner's Manual, Maintenance, and Warranty manual.

Figure 3-6. Corsair 36 Garboard Drain

The bilge pumps are wired directly to the HOUSE battery for operation in the automatic mode. In the automatic mode, the bilge pump starts pumping as the water level reaches the bilge pump float switch. The switch on the dash (Figure 3-1) illuminates if an auto-float switch activates the pump.

If a bilge pump automatically activates, inspect the area immediately.

The House battery is also used as the Generator starting battery in these models. Because the pumps are wired directly to this battery the pumps can activate regardless of the Red Master Battery Switch setting. However the bilge pumps are protected by circuit breakers located on the Battery Switch Panel. Placing these breakers to the OFF position, or if they trip to the OFF position, de-energizes the pump.

The bilge pump is normally held in place with clips for easy removal and cleaning. Use care when removing and reinstalling the bilge pump. If you remove the pump for cleaning, after reinstalling perform a systems test to ensure proper operation.

For additional information on the battery system refer to the "Electrical System" on page 3-31.

Figure 3-7. Battery Switch Panel - Bilge Pump Circuit Breakers

Should a bilge pump fail to operate, check the breakers and wiring connections. If the pump operates but fails to discharge water, inspect for clogs or kinks in the discharge line.

If oil is present in the bilge, do not use the bilge pump to discharge the waste. Mop up the waste and dispose of properly.

Bilge Pumps

The additional weight of water in the boat can adversely affect handling characteristics creating an unsafe condition. In addition sloshing water may be corrosive to the boat's systems.

Since water is heavy (over 8 pounds per gallon) it must not be allowed to accumulate within the vessel.

It is highly recommended there be at least one hand operated pump on the vessel in the event of a bilge pump failure.

General Maintenance

On a regular basis you should:

1. Inspect the bilge pump intake and keep it free of dirt or material, which may impede the flow of water through the pump.
   – To remove the pump strainer, depress the lock tabs on both sides of the pump and lift the pump motor.
2. Check the bilge pump float switch by moving it manually.
   – The float switch should move freely without sticking or binding. If it doesn't, service or replace the switch before using the boat.
3. The bilge pump should start when the float switch is raised and should stop when lowered.
   – If the pump does not start, reset the circuit breakers. If the pump still fails to start, replace the float switch before using the boat.
   – If you have to remove the float switch, verify proper operation of the new switch.
4. After inspection reinstall the unit.

Electric Bilge Pumps

NOTICE

It is illegal to discharge oily bilge water into the waters of the United States.
Bilge oil spills must be mopped up and the oil and rags properly disposed of.

There are four (4) bilge pumps in this boat, located on the centerline in the engine compartment. One bilge pump is located forward and three are located in the engine compartment. The RH uses the Rule 2000 GPH model. For switch location refer to Figure 3-1.

Three of the bilge pumps may be operated in the "manual" mode by placing the bilge pump switch, located on the helm control panel, to the **ON** position. The indicator light on the switch illuminates indicating the pump is energized. One bilge pump is a high-water pump and engages automatically when the float switch is tripped and will sound an audible alarm at the helm.

Do not run a bilge pump for an extended period of time in a dry environment.
Damage and/or premature wear to the pump may result.

Fuel Systems

Leaking fuel is a fire and explosion hazard. Inspect the system on a regular basis.
Inspect all fittings, valves, filters, hoses, and connections for leaks.
Do not operate the engines if any fuel leak is present.

Do not store fuel or flammable liquids in a closed area.
Explosive vapors may accumulate.

The fuel system is installed and tested in accordance with American Boat and Yacht Council (ABYC) Standard H-33 and H-24. Only qualified persons familiar with the practices established in this standard should make repairs or modifications to the fuel system.

The fuel system is comprised of the following components:

- Fuel Tank and Routing Lines
- Fuel Gauges/Sending Units
- Fuel Shut-off Valves
- Fill Deck Plate
- Fuel Tank Vents
- Fuel Filters
- Fuel Fill Hose
- Fuel Tank Vent Hose
- Engine Fuel Feed Hose
- Charcoal Vent Canister

Fuel Tanks

NOTICE

Fuel capacities are approximate measures. Always allow for adequate reserve of fuel when operating the boat.

The Chris-Craft Corsair 36 has aluminum fuel tanks with capacity of 270 gallons (1,022 Liters). Usable fuel will be less than capacity rating and depends upon trim conditions. Good seamanship calls for an adequate fuel reserve in all boating activities.

CAUTION

DO NOT put fuel in the water tank or water in the fuel tank.

The fuel fill deck plate (Figure 3-8) is located on either the starboard or port gunnel of the boat. The fill cap is clearly labeled.

Figure 3-8. Fuel Tank Fill Deck Plate

The fuel tank connects to the following items:

- Fuel Fill Hose
- Fuel Tank Vent Hose
- Engine Fuel Feed Hose
- Engine Return Hose (Diesel Only)
- Sending Unit
- Manual Shut-off Valves
- Generator Fuel Control Valve

On the Corsair 36 there are two (2) fuel tanks, one port, one starboard, each with their own fuel fill. The port fuel tank feeds the port engine and the starboard fuel tank feeds the starboard engine. Both fuel tanks supply fuel to the generator in gasoline and diesel engine installations. The return lines when used will route unburned fuel back to their respective fuel tanks as well.

There are manual fuel shutoff valves located on the top of the fuel tanks, one for each engine and one for the generator. Figure 3-9 illustrates a typical manual shut-off valve configuration for the engines and the generator.

Engines Manual Shut Off Valves **Generator Fuel Cross Over Valve**

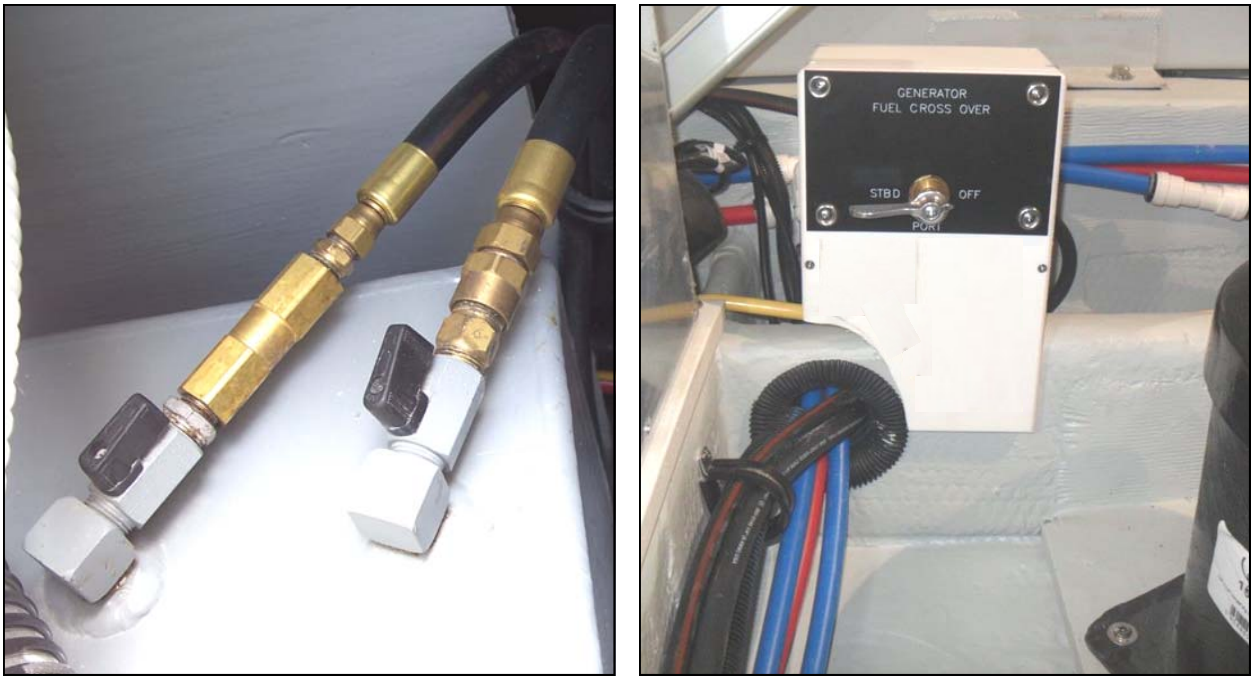


Figure 3-9. Fuel Tank Connections with Manual Shutoff Valves (Two Photos)

Fuel Gauge

A sending unit is installed in each fuel tank which senses the fuel level in the tank and displays the quantity on the fuel gauge located on the instrument panel. However it is clearly labeled. Figure 3-10 illustrates The location of the fuel gauges for both fuel tanks. Each fuel tank has its own fuel gauge.

The fuel indication is not 100% accurate so fuel planning is highly recommended. Maintain a reserve fuel supply when planning a trip by following the "Two Thirds Rule" ... ***One third to go out … Two thirds to get home.***

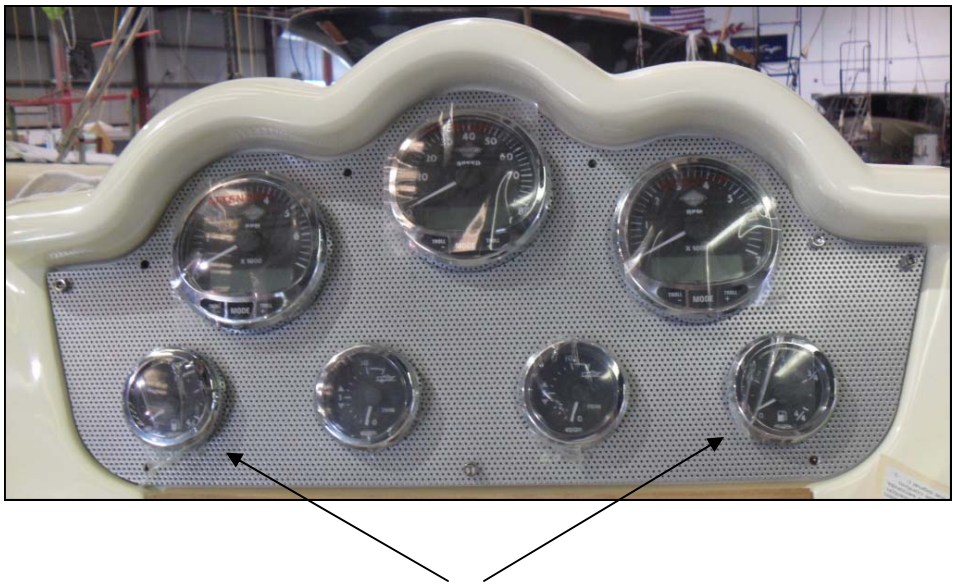


Figure 3-10. Fuel Gauges

Steering Systems

Each of the optional steering systems that are available for this boat will have a manufacturer's instruction manual included in the owner's documentation package.

Steering is provided by the propeller/sterndrive assembly itself eliminating the need of a rudder. A power steering system, sometimes including the Volvo Joystick and Mercury Axius System, is used to make operating the boat easier. A steering system owner's manual is delivered as part of the documentation package you receive when you take possession of your boat. It is your responsibility to become familiar with the contents of the manual and how the system operates, as only rudimentary information is repeated here.

A hydraulic pump, with built-in reservoir, is mounted on the engine and provides power steering for the boat. Turning the wheel pumps hydraulic fluid to the steering cylinder, which is attached to the sterndrive assembly. This fluid moves a hydraulic cylinder, which in turn moves the sterndrive in the desired direction.

As part of the regular maintenance cycle, ensure the power steering reservoir contains the proper amount of fluid. Verify with your dealer the type of steering/hydraulic fluid your boat uses. Use only the recom-

Engines

There are a variety of engine options you can select from for your boat. When you take possession of your boat, you receive the appropriate engine manuals for your boat. As the owner/operator, it is your responsibility to familiarize yourself with the performance specifications and maintenance requirements of your engine.

Because of the various engine options available, this manual does not discuss any one particular engine. However, there are common components associated with each engine which are discussed in this section.

Ignition Switches

There is one ignition switch for each engine. The switches are located on the helm control panel. See (Figure 3-11).

Diesel Engines have an ignition key and you will press the **START/STOP** buttons to crank the engine.

If the batteries become degraded (low on power), you can electrically link the batteries together to provide additional cranking power for the engines. This is accomplished by engaging the Parallel Start Switch located on the helm. To operate hold the switch in the **START** position and crank the engine until it is started.

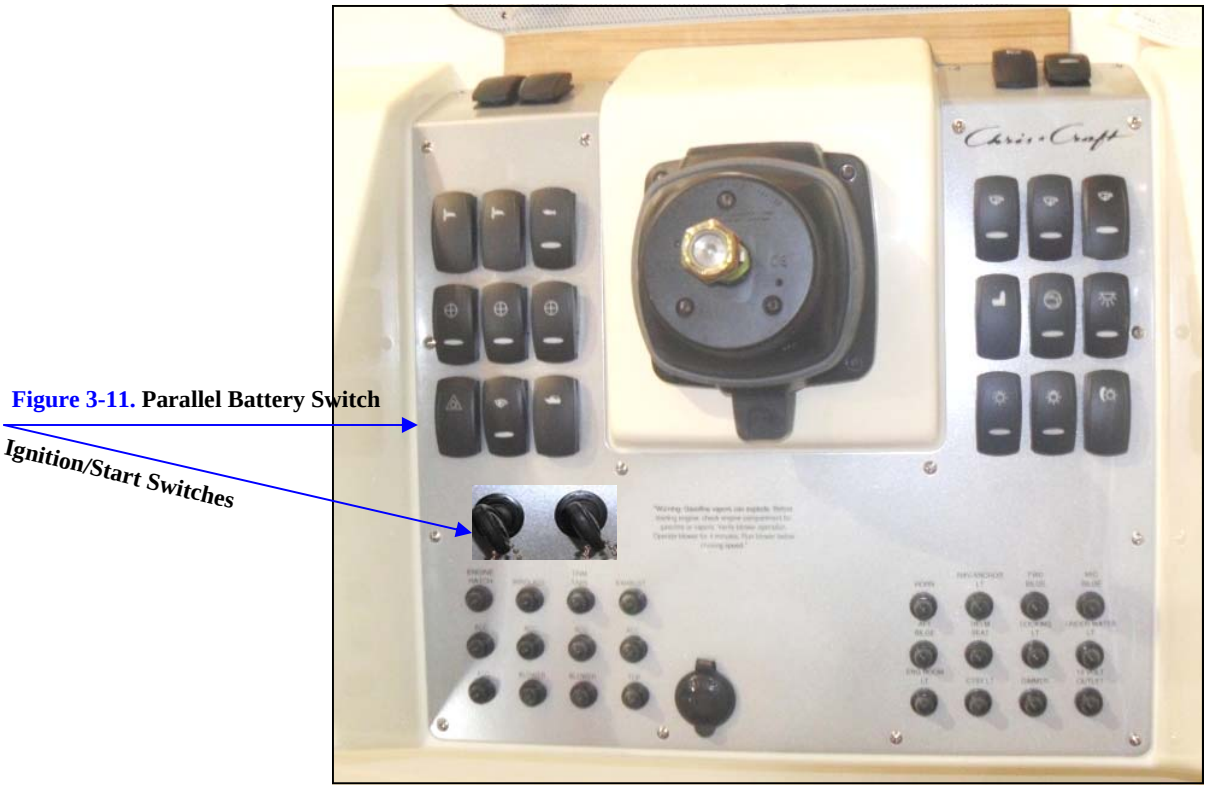


Figure 3-11. Parallel Battery Switch

CAUTION

Do not start the engines without some type of cooling water circulating through the engines. Damage to the engines will result.

To start the engines:

1. Ensure the fuel shut-off valve on the fuel tank is in the open position. In diesel engine installations verify the return valve is open.
2. Turn on the Red Master Battery Switch and/or engage any other circuit breakers that may be required for engine start. There is one Red Master Battery Switch for each engine and the Generator.
3. Ensure you have an adequate supply of cooling water circulating through the engine.
4. Ensure no one is around the propellers and that they are free of obstacles.
5. Drop the sterndrives into the water (if launching the boat).
6. Place the throttles in NEUTRAL.
7. Activate the engine compartment blower and allow approximately four (4) minutes for the compartment to ventilate.
8. Start the engines.
9. Gauge readings – Normal

Ensure someone is at the controls at all times.
DO NOT leave the helm unattended with the engines running.

To stop the engines:

1. Turn the ignition switches to **OFF.**
2. Turn off any circuit breakers necessary to prevent a restart.
3. If required, turn off the fuel shut-off valve on the fuel tank.

Do not approach the propellers until the engines have come to a complete stop and there is no chance that the engine will restart.

Engine Throttles

There is one throttle for each engine (Figure 3-13). The throttles controls the engine speed which dictates the speed of the boat through the water. The throttle combines direction and power in one unit. Moving the throttle forward increases the engine speed until full forward power is reached. Moving the throttle aft puts the boat in reverse. Continued aft movement of the throttle increases engine speed until full power is reached. The middle detent is the NEUTRAL position. The engines will not start unless the throttles are in the NEUTRAL position.

Work with your dealer for instructions on the best way of handling throttle control.

Figure 3-12. Dual Engine Throttles

Engine (Power) Trim

Each engine uses a trim switch (Figure 3-14) which works in conjunction with the trim tabs and performs the following functions:

- Moves the sterndrives angle up or down to provide optimum running conditions.
- Allows the boat to come up on plane more quickly and efficiently.
- The power trim also allows the sterndrives to be fully raised so that the boat may be trailered or un-trailered without damaging the sterndrive/propeller.

When using the engine trim, keep the following in mind:

- Avoid a bow-down condition. This is known as “plowing” which can result in unintentional consequences. Readjust trim to correct this condition.
- Avoid a bow-up condition. This is known as “porpoising” or “propeller ventilation.” This condition creates an unsafe propeller speed which may damage the engines. Reduce engine RPM and readjust trim to correct this situation.
- When attempting to come up on plane always start with the sterndrives down.

Figure 3-13. Dual Engine Trim Switches

Engine Instruments

You should become familiar with "normal" gauge readings for your engines and become accustomed to scanning the instruments when running. Unusual instrument readings require immediate attention. Do not ignore unusually high or low instrument readings. Shut down the engine and have the problem diagnosed before operating the engine.

Tachometer

The tachometer indicates the revolutions per minute (RPM) of the engine. Important RPM's to note from the manufacturer's engine manual include idle RPM, normal cruise RPM and maximum RPM. The maximum RPM should not be exceeded. Although tachometers do not indicate boat speed, a careful helmsmen will chart boat speed vs. RPM so that, in the event of other electronics problems, he will have a very good idea of boat speed from his tachometers. A sudden change of RPM may indicate a problem within the engine or a problem with the drive train or running gear. Do not ignore "unexplainable" changes in RPM. A simple check of the engine and running gear may prevent costly repairs.

Speedometer

Read in miles and kilometers per hour. Indicates speed of the boat.

Oil Pressure Gauge

The oil pressure gauge measures the pressure of the lubricating oil circulating through the engine. Adequate oil pressure is required to pump oil into the many highly-loaded bearings that require lubrication. Inadequate oil pressure can lead to excess wear and possibly catastrophic failure of the engine. Check the manufacturer's engine manual to determine normal oil pressure for the engines in your boat. Shut down and do not operate an engine that has had a loss of oil pressure.

Water Temperature Gauge

The water temperature gauge indicates the temperature of the coolant mixture circulating inside the engines cooling circuit. The engine is equipped with a thermostat that controls flow of coolant within the engine thus maintaining correct operating temperature. Engine coolant temperature is not affected by seawater temperature. Correct operating coolant temperature indications for your engine may be found in the engine manufacturer's manual. An unusual change in temperature may indicate problems with the raw water circuit or internal engine problems causing excess heat. Shut down and do not operate an engine that is indicating coolant temperature in excess of the manufacturer's maximum allowable temperature.

Voltmeter

The voltmeter monitors the voltage of the battery and the charging circuit of the engine. Normal voltage for a fully charged battery with the engines shut down is about 12.8 volts. With the engines running a charging voltage of 13 to 15 volts should be indicated. Low voltage with the engines running (less than 12 volts) indicates a possible problem with the charging circuit. The engines are unlikely to start with less than 12 volts indicated on the volt meters.

Fuel Gauge

The fuel gauge indicates the fuel *level* in the tanks. Due to the irregular shape of the fuel tanks and the angle of the tanks when running, indicated fuel *level* does not correspond directly with the ratio of remaining fuel to total fuel capacity (i.e. an indicated fuel level of 1/2 does not indicate 1/2 the capacity of the tank is remaining, but indicates the level of the fuel is 1/2 the height of the tank at the sender). Remember, not all fuel capacity is usable capacity. Careful planning of long trips using a safety reserve is advised. It is always prudent to fill the tanks completely after each use to prevent condensation within the tanks.

Engine Hour Meter

The engine hour meter is actually located on the engine itself and indicates the total cumulative time in hours of operation. The engine hours should be noted on the engine log for all oil changes, filter changes, scheduled and unscheduled maintenance. An accurate and carefully maintained engine log is a valuable tool when diagnosing problems, when seeking warranty compensation from the engine manufacturer and when your boat is re-sold.

Figure 3-15 illustrates a typical instrument panel layout.

Figure 3-14. Instrument Configuration

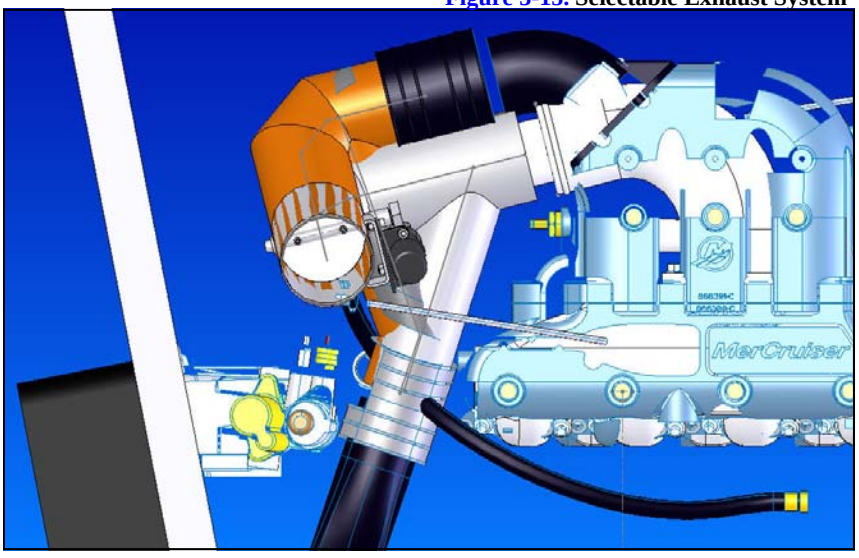
Selectable Exhaust

NOTICE

Check your state and local noise laws prior to using the Corsa Selectable Exhaust System.

Chris-Craft boats offer the option of a “selectable exhaust” which provides a “throaty” sound when operating away from shore and a “muffled” exhaust when operating within basin sound limitation boundaries. The mode is selected by a switch located on the helm control panel. Actual location of the switch may vary from model to model. Prior to every use of the boat, examine the exhaust system to ensure tightness of the fittings.

Figure 3-15. Selectable Exhaust System



Engine Compartment Blower

NOTICE

Ventilate the engine compartment before starting the engines. The compartment should be ventilated a minimum of four (4) minutes.

The engine compartment may accumulate fumes when the engines are not running. Before starting the engines ventilate the engine compartment to remove any vapors that may have accumulated. The best course of action is to open the engine hatch and allow the vapors to escape. However, if that is not possible, or is inconvenient, then each boat is equipped with an engine compartment exhaust blower which can be used to ventilate the compartment. Run the blower for at least four (4) minutes to ventilate the compartment before starting the engines.

If the boat is moving slowly, gasoline fumes can accumulate because not enough air is moving through the engine compartment to keep it clear of vapors.

Anytime the boat is moving slow, engage the blower to remove any fuel vapors that may be accumulating in the engine compartment.

Inspect the blower system prior to every use. The blower makes a distinctive sound when operating properly. If the blower is not operating, repair or replace prior to using the boat again. The blower switch is located on the Helm Switch Panel (Figure 3-1).

Figure 3-16. Engine Compartment Blower

Trim Tabs

CAUTION

Ensure trim tabs are completely retracted when backing the boat. Damage to the trim tabs may result otherwise.

Hydraulic Trim tabs (Figure 3-17) help adjust the vessel trim for weather, cross-winds, and water current conditions. In addition they are used to adjust for listing due to uneven loading and propeller torque.

The trim tab system consists of:

- Hydraulic Pump and Reservoir
- Trim Tabs
- Control Switches
- Zinc

Figure 3-17. Trim Tab Switches

Figure 3-18. Trim Tab Cylinder & Plate

Figure 3-19.

Theory of Operation

Trim tabs are used to modify the running angle of the boat. The Chris-Craft is designed to plane at a particular speed and weight distribution. As weight increases and/or speed decreases, the stern settles creating an inefficient, untrimmed condition. In this bow-high position, visibility is limited, fuel economy is poor and wake is large. Additionally the hull bottom may be pounded by waves. Trim tabs allows the vessel to plane at heavier loads and slower speeds than the designed planing speed.

Increased trim may improve the ride in a head sea by allowing the bow to cleave the waves, rather than pound over them. In a following sea, the tabs should be fully retracted for maximum steering response. A listing condition may be corrected by applying more trim on one side. Too much trim will increase the drag and cause the bow to “dig in” allowing wave action to veer the boat.

As the owner/operator, it is you responsibility to understand how trim tabs affect the characteristics of the boat. The Trim Tab Owner’s Manual that accompanies this vessel provides additional operating and safety instructions, which is not repeated here.

However at a minimum:

- Use trim tabs only at cruising speeds.
- Do not use more tab than is actually needed for good performance.
- Do not reduce the running angle less than 2°.
- Do not use the trim tabs when backing or running an inlet. Damage to the cylinders and tabs may result.
- Fully retract the trim tabs when trailering the boat or if leaving the boat to sit in the water for any extended length of time.
- Spend time getting familiar with how the trim tabs affect the vessel.

Improper use of the trim tabs can cause an accident and/or injury.

.

Trim Tab Hydraulic System

The trim tab hydraulic system is comprised of the following components:

- Hydraulic Pump
- Reservoir
- Hydraulic Cylinders

Trim Tab Hydraulic Pump

The trim tab hydraulic pump is a 12VDC electric-driven pump. When activated, the electric motor pumps hydraulic fluid to the hydraulic cylinder located on each tab. The high-pressure oil drives the piston downwards and pivots the aft section of the trim tab down below the bottom of the boat.

Trim Tab Reservoir

A hydraulic reservoir is built into the base of the pump. Fluid is drawn from the reservoir when the tabs are driven downward and returned to the reservoir when the tabs retract.

Verify fluid level in the hydraulic pump reservoir on a regular basis. With the trim tabs completely retracted the fluid level should be about two (2) inches from the bottom of the reservoir. To refill, remove lexan cover and filler plug located at the front left hand corner of the reservoir. Fill with any type of Automatic Transmission Fluid (ATF) only. Brands of ATF can be mixed.

Trim Tab Control Switches

There is a trim tab switch for each trim tab. The trim tab switches (Figure 3-18) are located on the helm switch control panel. When pressed, the switch activates the pressure pump that moves the trim tab in the desired direction.

To correct for a listing condition you must lower the trim tab on the listed (lower) side by pushing the top half of the rocker switch in a half second burst until the boat is righted.

If the stern of the boat is highly loaded, use both switches to operate both tabs, which lowers the bow when the boat is on plane.

Figure 3-20. Trim Tab Control Switches

Trim Tab Zinc Plate

Each trim tab contains a sacrificial zinc plate which slows the development of corrosion on the tab. This plate should be inspected and replaced when necessary.

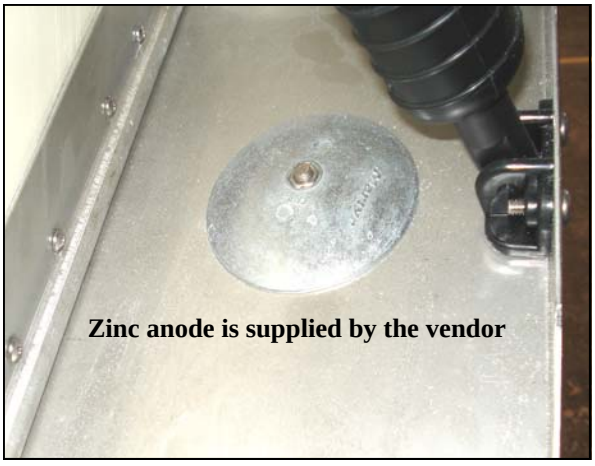


Figure 3-21. Trim Tab Zinc Plate

Fresh Water System

CAUTION

The water tank fill deck plate is located on the opposite side of the fuel fill deck plate.
DO NOT put fuel in the water tank or water in the fuel tank.

The components of the water system consists of:

- Water Tank
- Water Heater
- Pressure Pump
- Water Fill Plate
- Transom Shower
- Piping
- Cockpit Sink (Corsair 36)
- Galley Sink
- Head Sink
- Shower
- Tank Level Meter

A fresh water deck fill is located on the side of the boat and clearly marked WATER. Actual location and physical appearance of the fill plate may vary from model to model, but it is clearly labeled.

The water pressure pump (Figure 3-22) is a pressure-demand type pump. When energized the pump immediately pressurizes the water system. When the operating pressure is reached the pump shuts off until it senses a loss of pressure, such as a faucet being opened, at which time it is automatically re-energized.

If the pump cycles on and off without a faucet being opened it may indicate a pressure leak in the system or excessive air in the system. Bleed the system of air by opening all faucets until only water is flowing from each. If a leak is present, or suspected, find and repair the leak.

A fresh water filter is attached to the pump (Figure 3-22) and should be checked and cleaned on a regular schedule. The pump and filter is located in the engine compartment.

When air enters the system it becomes necessary to purge it for proper operation. To bleed the system of air, follow the steps outlined in “Using the Fresh Water System” on page 3-27.

Figure 3-22. Fresh Water Pump and Filter

A switch (Figure 3-23) on the salon circuit breaker panel energizes the pump.

Figure 3-23. Fresh Water Pressure Pump Circuit Breaker

CAUTION

Do not use the water heater in a dry environment. Damage to the unit may result. Ensure the unit is filled with fresh water before using.

A six (6) gallon (22.7 L) water heater is installed in each model. There is an Owner's Manual that comes in your documentation package that addresses the use, maintenance, and troubleshooting of the system. It is your responsibility to become familiar with the unit specifics. A circuit breaker (Figure 3-22) on the salon breaker panel powers and protects the system. Shore power or generator power must be ON for the system to operate.

Figure 3-24. Water Heater

Figure 3-25. Water Heater Salon Circuit Breaker

Sanitizing the Fresh Water System

Sanitizing solution contains bleach. Do not drink. Tag all faucets to notify that the system is being sanitized.

You should always sanitize the fresh water system under the following conditions:

- Before using it the first time.
- After winter storage.
- When the system has not been used for an extended period.

To sanitize the water system:

1. Ensure the water tank is empty before beginning this process.
2. You will need approximately one (1) gallon of weak bleach solution for each fifteen (15) gallons of tank water.
3. In an appropriate size bucket, make a solution bleach and water using ¼ cup of household, unscented bleach per gallon of fresh water.
4. Dump water into water tank. Fill the remainder of the tank with fresh water.
5. Activate the water pump and allow air to bleed from the system. Ensure the sanitizing solution is in all parts of the water system.
6. Allow treated water solution to remain in the system for three to four hours.
7. Drain treated water solution from lines and empty tank.
8. Flush entire system with fresh water, ensuring that all air bled from the system.
9. Empty the system completely, refill, and bleed of air. The system is now ready to use.

If fresh water has an excessive chlorine taste after sanitizing the system:

1. Pour a solution of 1 quart (0.95 liter) of vinegar and 5 gallons (19 liters) of fresh water into the water tank.
2. Allow the solution to stand for three days.
3. Drain the entire system and thoroughly flush with fresh water.

Using the Fresh Water System

The water tank fill deck plate may be located in the general vicinity of the fuel fill deck plate.
DO NOT put fuel in the water tank or water in the fuel tank.

Always keep the fresh water tank full. A full water tank helps keep the water potable.

To fill the water tank:

1. Ensure the water supply is suitable for drinking. If filling from the dock check with the dock-master to verify the water is potable.
2. Remove the filler cap and fill the tank until water flows from the vent.
3. Secure the filler cap.-

You will need to start the system whenever the tank is empty and air is in the supply lines. To start or use the fresh water system:

1. Sanitize the system as previously described.
2. Fill the water tank with potable water.
3. Energize the pressure pump.
   a. The boat must have electrical power to energize the pressure pump. This can be the batteries, or if so equipped, an external power source.
   b. Turn on the water pressure switch on the salon circuit breaker panel.
4. Open a hot water faucet to fill the water heater and allow air to escape from the line. Close the faucet when free of air.
5. Starting with the cold water faucet furthest from the pump, open each faucet until you see a steady stream of water from each faucet. Close the faucets.
6. Open the faucet furthest from the water heater first then open all other faucets. Run until you see a steady stream of water from each faucet. Close the faucets.
7. Refill the water tank and turn off the pressure pump.

Troubleshooting Water Systems

Use the following procedure to help troubleshoot any water problem.

Table 3-2. Water Troubleshooting Chart

Problem	Probable Cause	Solution
Sea water pressure is low	Seacock valve is partially closed Seacock strainer is clogged	Open valve Clean Strainer
Water sputters from faucet	Water tank is empty Air in system	Open faucet to exhaust air, then close the faucet when a steady stream of water begins to flow
Fresh water pump cycles ON and OFF.		Find and repair leak
No water when faucet is opened	Pump breaker OFF Water tank is empty Blocked water lines Defective pump pressure switch	Switch breaker ON Fill water tank Find and clear obstruction Replace switch
Pump does not run	Pump breaker OFF Water tank is empty Defective pump pressure switch Defective pump	Switch breaker ON Check connections, tighten as necessary Replace switch Refer to dealer for service

Marine Sanitation System

CAUTION

Waste in the holding tank can form methane, an explosive gas.
Keep vent open and clear of obstructions.
Keep fire and flame away when maintaining the system.

NOTICE

It is illegal to dump plastic trash anywhere in the ocean or navigable waters of the United States, including the Great Lakes. The discharge of other types of garbage is permitted outside of specific distance offshore as determined by the nature of that garbage.

All recreational boats with installed toilet facilities must have an operable Marine Sanitation Device (MSD) aboard. Vessels 65 feet and under may use a Type I, II, or III MSD. All installed MSD's must be Coast Guard certified.

The Holding Tank installed in the Chris-Craft is certified by definition under the regulations and is not specifically labeled. Do not flush foreign objects down the MSD. Damage to the system may result.

The Marine Toilet Owner's Manual that comes in your documentation package addresses the use, maintenance, and troubleshooting of the Techma waste system. It is your responsibility to become familiar with its contents as only rudimentary information is presented here.

The Techma units utilizes a grinding system that grinds all waste before it enters the pump. This system virtually eliminates clogging while consuming very little water. The cycle is completely automatic and works on a 12/24 VDC electrical system.

The Techma system can be configured with one of two types of control switches: a one switch unit, or a two switch unit. With the one switch unit, a specific quantity of water remains in the water closet. Pressing the button begins the automatic flushing cycle.

With the two switch system, the water closet remains completely dry. Press the "Before Use" button to send a specific quantity of water into the bowl. Press the "After Use" button to begin the automatic flushing cycle. This leaves the water closet clean and dry.

A tank sensor (Figure 3-26) monitors the fluid level in the fresh water, grey water, and holding tanks. Press the appropriate button on the touchpad to read the fluid level in the selected tank.

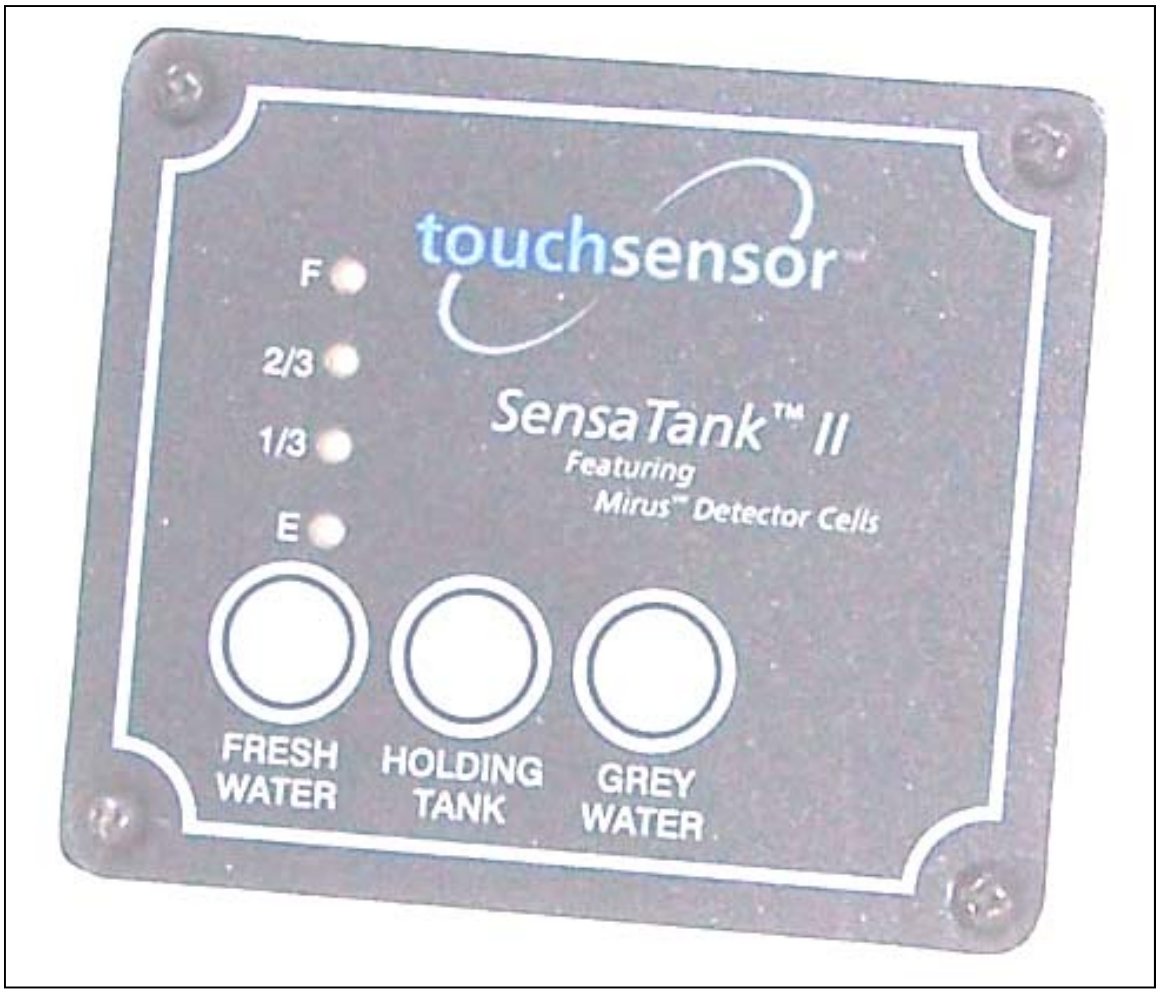


Figure 3-26. Fluid Tank Sensor

Electrical System

The models discussed in this manual have an AC/DC electrical system. Both systems are complex entities hence it is critical that you understand how the electrical system affects the boat and its components.

Electrical Safety

NEVER:

- **Work on the electrical system while the system is energized.**
- **Modify the craft's electrical system or relevant drawings: installation, alterations, and maintenance should be performed by a competent marine electrical technician.**
- **Alter or modify the rated current amperage of over-current protective devices.**
- **Install or replace electrical appliances or devices with components exceeding the rated current amperage of the circuit.**
- **Leave the craft unattended with the electrical system energized, except automatic bilge pumps, fire protection, and alarm circuits.**
- **Allow the shore power cable to hang in the water. An electrical field may be caused which can cause injury or death to nearby swimmers.**

Electricity can be very dangerous and hazardous. It is incumbent upon the owner/operator to understand basic electrical safety before working on any electrical system associated with the vessel. Other safety considerations are:

- Disconnect shore power connections when the system is not in use.
- Use double insulated or grounded electrical appliances.
- Do not alter shore power cable connectors. Use only compatible connections.

The Electrical system is installed and tested in accordance with American Boat & Yacht Council Standard E-9 and/or ISO 10133. Only persons familiar with the practices established in this standard should make repairs or modifications to the system.

Electrical System Overview

This section provides a basic overview of both the AC and DC systems. Individual systems are discussed in their respective section.

There are numerous circuit breakers in the system to prevent an electrical overload and protect the equipment from damage.

There are two main panels that control electrical load:

- The DC Battery Switch Panel
- The Salon Main Circuit Breaker Panel

The DC Battery Switch Panel (Figure 3-27) controls power to the DC systems. Each master red switch engages or disengages a specific battery. The small breaker switches energizes and protects specific circuits and components attached to this panel. Some components are constantly powered **ON**, while others require the appropriate red master switch to be turned **ON**.

Leave **ALL** breakers **ON** at all times. Use the switches to turn systems **ON** or **OFF**.

Figure 3-27. Battery Switch Panel

The salon Main Circuit Breaker Panel (Figure 3-31) is located in the cabin of the boat and provides circuit breakers to protect both AC and DC powered systems. The panel receives power from three sources:

- The generator
- The DC Battery Switch Panel
- Shore Power Chords

The shore power chords and the generator provide AC power top the top section of the panel protects those circuits appropriately. The DC power bottom section receives power from the batteries and accommodates the breakers for the DC protected systems. Additional information about this panel is provided in:

"Salon Main Circuit Breaker Panel" on page 3-44.

Figure 3-28. Main Salon Circuit Breaker Panel

Zinc Plate

Both the AC and DC systems must be grounded in order to function properly. The 36 RH Corsair uses a cathode bond system to connect all underwater components and through-hull fittings. A sacrificial zinc plate is mounted on the centerline of the transom and helps protect these fittings from corrosion. This plate should be inspected and replaced at regular maintenance intervals to ensure corrosion protection.

Figure 3-29. Zinc Plate

DC Electrical System

Explosive hydrogen gas is given off by charging batteries. Batteries will explode if an open flame or spark ignites the hydrogen gas.

Never use an open flame in the battery area. Do not strike sparks near the batteries.

Working on engine starting circuits or alternators with battery cables connected can cause severe injury or death.

Battery cables should be disconnected from the batteries before working on the engine starting circuits or the alternator.

If any circuit breaker should trip, do not activate the system until the cause of the malfunction has been determined and corrected.

The DC electrical system is a 12VDC system and is composed of the following components:

- Batteries
- Battery Charging System
- Circuit Breakers
- Battery Distribution Panel

The batteries are normally charged through an engine-driven alternator or via shore power through a battery charger. A volt meter on the helm shows the charge level of each engine start battery. The DC Salon Panel reads the House Battery Voltage with a meter.

There are three batteries in the boat:

- Port
- Starboard
- Generator / House

The Generator battery is also known as the ***House*** battery, which supplies power to several DC systems of the boat.

Battery System

CAUTION

Never disconnect battery cables when the engine is running. Damage to the electrical system may result.

The batteries (Figure 3-27) are used to supply DC power to the boat. All marine batteries provide high capacity current plus cold cranking performance. The batteries are not maintenance free thus requiring periodic maintenance. To keep your batteries in good condition at a minimum you should:

- Maintain the water level in the battery cells.
- Keep the terminals clean.
- Keep the case clean.
- Keep the battery charged.

Many variables affect the life of a battery. Some of these are, but not limited to:

- Usage
- Temperature
- Charging
- Age

Battery Cables are color coded

- **Blue ……..** **Blue Tape** On **Yellow Cable** is the **Ground** for the **House Battery**
- **Blue ……..** **Blue Tape** On **Red Cable** is the **Positive** for the **House Battery**
- **Red ……...** **Red Tape** On **Yellow Cable** is the **Ground** for the **Port Engine Battery**
- **Red ……...** **Red Tape** On **Red Cable** is the **Positive** for the **Port Engine Battery**
- **Green ……** **Green Tape** on **Yellow Cable** is the **Ground** for the **Starboard Engine Battery**
- **Green ……. Green Tape** on **Red Cable** is the **Positive** for the **Starboard Engine Battery**
- **Single White Wire** is the **Charger Temperature Sensor** and goes to the **House Battery Negative Post**

Always inspect the condition of the batteries and the cables before starting the engines. When inspecting ***ALWAYS*** utilize proper safety precautions.

A low water level may cause the batteries to fail or possibly explode. Therefore take corrective action immediately. If you must replace one battery, replace them all.

Figure 3-30. Ship Batteries

Battery Charging

Each engine has an alternator which not only charges the batteries which provides DC electrical power to the boat. In addition a fully automatic battery charger (Figure 3-28) is located on the firewall to recharge all three batteries.

The charger is protected by three circuit breakers on the Battery Switch Panel. The three breakers control which battery is charged (port battery, starboard battery, or generator/house battery). By default all three breakers are protected and set to ON. ***Never*** turn these breakers OFF.

A manufacturer's operation booklet is supplied with the vessel and contains additional information which you should become familiar with.

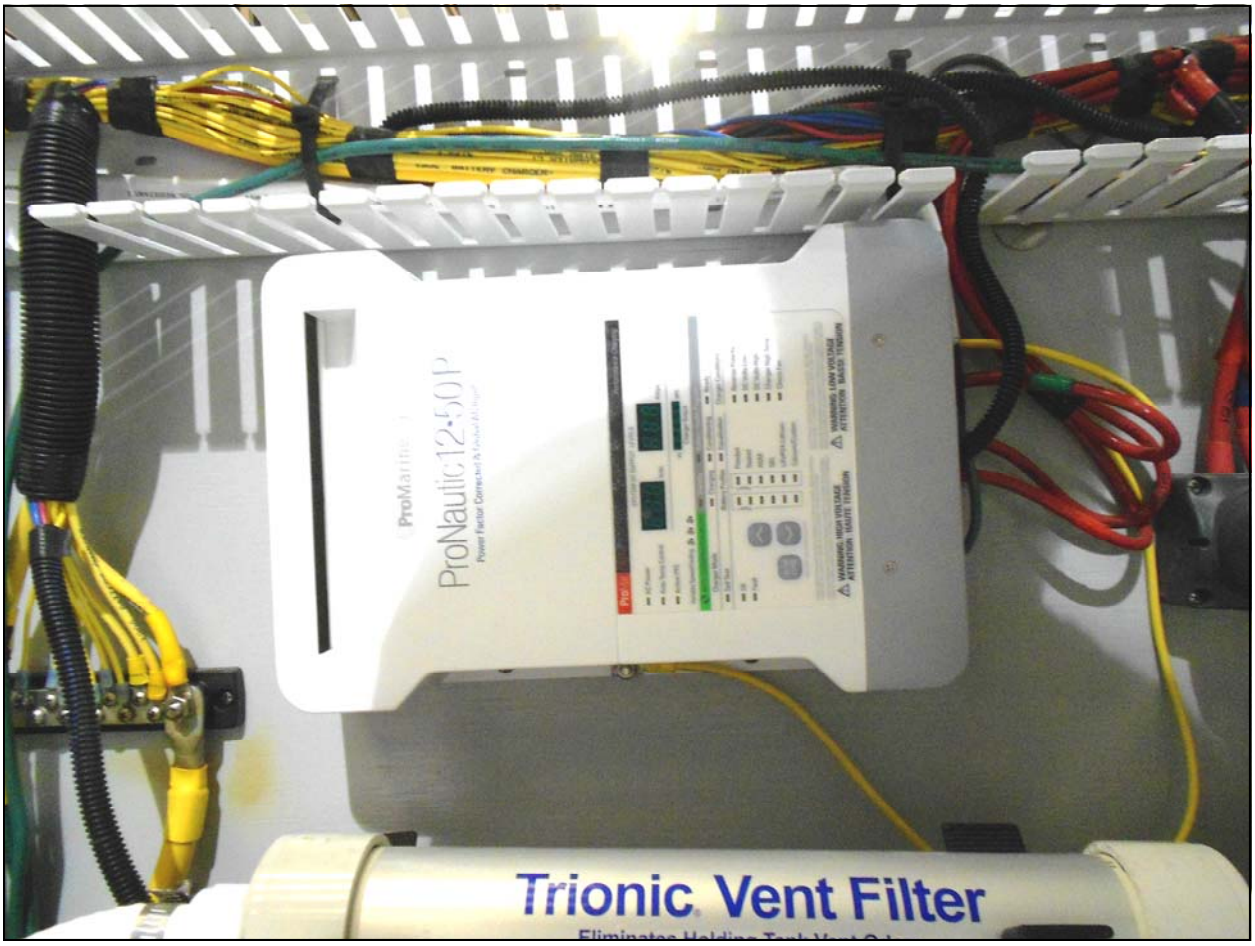


Figure 3-31. Battery Charger

Battery Powered Systems

The Battery Switch Panel controls how battery power is distributed. Some DC systems are constantly powered while others require the Red Master Battery Switches (Port Engine, Starboard Engine, Generator / House) be turned **ON.** It is important to keep the battery charger working (connected to shore power) when the craft is not in use, otherwise the batteries may discharge due to the stereo memory and the carbon monoxide monitors.

The following systems are under constant power regardless of the Red Master Switch setting:

- Bilge Pumps
- Audio/Video Memory
- CO Monitors
- Shower Sump

The following systems are engaged when the Generator/House Red Master Battery Switch is turned **ON:**

- Ships Service
- Helm Service
- Electronics Service

The following systems are engaged when the Starboard Engine Red Master Battery Switch is turned **ON:**

- Engine Hatch
- Windlass

Each of these systems may be disengaged by turning the appropriate battery switch to **OFF.**

A DC powered fuse block is also installed on the boat. This fuse block is located in the cabin on the starboard side. This fuse block permits the owner to install additional and/or aftermarket components to the boat. To power the fuse block the Generator/House battery must be energized and the Electronics Service circuit breaker on the Battery Switch Panel turned **ON.**

Battery Specifications

Table 3-3 provides an overview of the batteries cranking power.

Table 3-3. Battery Specifications

Battery	Group	CCA	Reserve Minutes	Volts
Port	**27**	**800**	**180**	**12 Volts**
Starboard	**27**	**800**	**180**	**12 Volts**
Generator/House	**27**	**600**	**160**	**12 Volts**

DC Wiring Color Codes

Color codes identify wiring throughout the boat. The color codes for the DC system is as follows:

- Red – Source Conductors
  Positive 12VDC. All current carrying conductors between the batteries and first switch or load device in a circuit. Bus bars, circuit breakers, terminals, and fuses in the source conductor are not considered switches or load devices.

- Yellow – Negative Conductors
  All current carrying DC negatives that terminate at the batteries or their terminals.

- Green – All Ground Conductors
  Non-current carrying grounding and bonding conductors.

There are several additional basic colors and color combinations for different circuits used beyond the ignition switch. Some of these colors can serve more than one type of circuit. Table 3-4 illustrates the color codes for the engine compartment and battery wiring.

Table 3-4. Engine/Battery Wire Codes

FUNCTION	WIRE COLOR
PORT STARTER	RED
PORT BATTERY	RED
STARBOARD STARTER	RED
STARBOARD BATTERY	RED
HOUSE BATTERY	RED
HOUR METER	WHITE
PORT ALTERNATOR	RED
STARBOARD ALTERNATOR	WHITE
PORT ENGINE	RED/VIOLET
PORT ENGINE TEMPERATURE	TAN
PORT ENGINE ALARM	TAN/BLUE
PORT ENGINE TACHOMETER	GRAY
PORT ENGINE OIL PRESSURE	LIGHT BLUE
PORT ENGINE TRIM LEVEL	BROWN/WHITE
PORT ENGINE IGNITION	VIOLET
PORT ENGINE STARTER	YELLOW/RED
GENERATOR BATTERY ISOLATER	RED
STARBOARD BATTERY ISOLATER	RED
PORT BATTERY ISOLATER	RED
PORT BATTERY CHARGER	RED (RED)
GENERATOR BATTERY CHARGER	RED (BLUE)
STARBOARD BATTERY CHARGER	RED (GREEN)
THRUSTER BATTERY CHARGER	RED
CABIN 12 VOLT OUTLET	RED
PORT SHUTDOWN	WHITE/RED

Table 3-4. Engine/Battery Wire Codes (Continued)

FUNCTION	WIRE COLOR
STARBOARD SHUTDOWN	WHITE/GREEN
STARBOARD ENGINE	RED/VIOLET
STARBOARD ENGINE TEMPERATURE	TAN
STARBOARD ENGINE ALARM	TAN/BLUE
STARBOARD ENGINE TACHOMETER	GRAY
STARBOARD ENGINE OIL PRESSURE	LIGHT BLUE
STARBOARD ENGINE TRIM LEVEL	BROWN/WHITE
STARBOARD ENGINE IGNITION	VIOLET
STARBOARD ENGINE STARTER SOLENOID	YELLOW/RED
GENERATOR STOP POWER	RED/WHITE
GENERATOR STOP	WHITE/RED
GENERATOR POWER	RED/VIOLET
GENERATOR PRE-HEAT	WHITE
GENERATOR START	YELLOW/RED
PORT PARALLEL START	RED
STARBOARD PARALLEL START	RED
BOW THRUSTER POWER	RED
BOW THRUSTER BATTERY	RED
BOW THRUSTER LEFT	WHITE/RED
BOW THRUSTER RIGHT	WHITE/GREEN
PORT SHUTDOWN POWER	RED/WHITE
PORT SHUTDOWN	WHITE/RED
STARBOARD SHUTDOWN POWER	GREEN
STARBOARD SHUTDOWN	WHITE/GREEN
HELM POWER	RED
MANUAL BILGE SWITCH POWER	RED
HELM SWITCH POWER	RED
GENERATOR STARTER	RED
GENERATOR BATTERY	RED
ELECTRONICS POWER	RED
SHIP'S SERVICE	RED
HATCH SOLENOID	RED
WINDLASS	RED
WINDLASS CONTROL UP	RED/BLUE
WINDLASS CONTROL DOWN	RED/GREEN

DC System Troubleshooting

CAUTION

Disconnect battery cables before performing all inspections, checks, troubleshooting, and repairs to avoid possible personal injury and damage to equipment.

Table 3-5. Direct Current Electrical Troubleshooting Chart

PROBLEM	CAUSE	SOLUTION
No power to 12 Volt equipment	Battery disconnect switch to OFF	Turn switch ON
	Battery selector switch turned to OFF	Switch selector switch ON for Port and Stbd battery
	Battery disconnect switch to OFF	Recharge battery and replace if necessary
Engine running, battery not charging	Engine alternator belt loose	Tighten belt
Battery not holding a charge	Bad battery	Replace battery
12 Volt device not working	Circuit breaker of device is OFF	Switch breaker ON
	Weak or Dead battery	Change battery selection switch position Charge battery
	Faulty electrical connection	Check 12 Volt connections. Tighten or repair as needed

AC Electrical System

The AC system obtains power from two sources:

- Shore power
- The generator

When connected to shore power the AC system operates on a standard 30 amp 120 volt, 60 hertz electrical circuit. Two receptacles at the stern of the boat allows for connection of the shore power cords. Actual location of the cords and plug-ins is on the Port Aft transom. Work with your dealer for the proper connection of the shore power cords for the 36 RH Corsair.
Figures 3-29 and 3-30 illustrates the shore power

Figure 3-32. Shore Power Connections

Figure 3-33. Shore Power Control Breaker 120 Volts

Figure 3-34. Shore Power Control Breaker 240 Volts

Direct Current Wiring Codes

Shore Power 1 energizes the following circuits:

- Television
- Port Outlets
- Galley Refrigeration
- Microwave/Coffee Maker
- Battery Charger
- Starboard Outlets
- Cooktop
- Water Heater

Shore Power 2 is a dedicated power source for the:

- Air Conditioner
- Cockpit Ice Maker
- Spares for Additional Options

It is not necessary to power both systems at the same time. You may pick and choose which components to power by selecting the appropriate shore power feed and the associated circuit breakers.

When energizing components it is necessary to also configure the Salon Main Circuit Breaker Panel. Panel configuration is discussed in "Salon Main Circuit Breaker Panel" on page 3-44.

Reverse Polarity

Reverse polarity refers to the reversal of the ungrounded current carrying conductor and the grounded current carrying conductor. The shore panel automatically senses a reverse polarity and turns on a "Reverse Polarity Light". **Never** ignore a reverse polarity indication. Ensure polarity is correct when connecting to shore power.

If a reverse polarity occurs:

1. Turn **OFF** the dock main shore power.
2. Verify the shore power cord is correctly seated and locked in place. Perform this step both on the vessel and at the dock connection.
3. After verifying shore power cord is firmly seated, turn the dock main breaker back on.
4. If the reverse polarity situation still exist, disconnect the power cord and have the dock master check the wiring at the dock's shore power receptacle.
5. If the wiring at the dock's shore power receptacle is correct, and a reverse polarity situation still exists, contact a qualified marine technician.

A Reverse Polarity warning is indicated on the Salon Main Circuit Breaker Panel.

Connecting and Disconnecting Shore Power

Use caution when connecting and disconnecting from shore power. Follow proper connecting and disconnecting procedures otherwise electrical shock may result.

Exceeding 30 amps on one power cord will cause the main breakers to trip. Reduce power load before resetting any breakers.

Never operate the shore power system at less than 105 volts.

This procedure connects shore power to a marina dock system.

To connect shore power:

1. Turn off all breakers at the dock station.
2. Attach both power cords to the boat receptacles and lock in place. For safety reasons do not attach the power cord to the dock first.
3. Plug in the cord at the dock station. Turn on dock station breakers.
4. Turn ON shore power control breakers located in the Port Aft storage locker.
5. Check for a reverse polarity indication. If a reverse polarity light illuminates, turn off dock power immediately. Refer to the Reverse Polarity section for corrective action.
6. Turn on the boats main AC breakers.
7. Turn on any boat systems desired, do not exceed 30 amps.

To disconnect from shore power:

1. Turn off all breakers at the dock station.
2. Turn off the boats AC main circuit breakers.
3. Disconnect the power cords from the dock station.
4. Disconnect the power cords from the boat.
5. Retrieve and store the power cords.

Salon Main Circuit Breaker Panel

The top section of the Salon Main Circuit Breaker Panel (Figure 3-31) controls the AC power system. Once an AC power source is selected, shore power or generator, the breaker panel must be configured to accept power from the source. A mechanical slide permits you to select only one power source, shore or generator. You cannot select both. You may choose to use both shore power feeds if desired.

If using the air conditioner energize that system first on start-up since it draws the most power.

To utilize shore power:

1. Ensure you have access to shore power and the appropriate Shore Power Control Breakers on the stern are turned **ON.** Verify no reverse polarity condition exist.
2. Place the mechanical slide on the salon breaker panel in the proper position. This allows you to select one or both shore power feeds.
3. Turn the Shore Power 1 and/or Shore Power 2 switch **ON.** When power is available the green light above the switches illuminates.
4. Read the power input on the volt meters located on the panel. Select Line 1 or Line 2 to read the power input for the appropriate line.
5. Set the circuit breakers as required. **DO NOT** turn on all breakers at the same time. Energize one system at a time to prevent an overload.
6. If using one shore power cord, be sure to plug into shore power and turn on the AC Panel Shore Power and Transfer Breakers.

To utilize generator power:

1. Start the generator and allow it to stabilize at operating temperature.
2. Place the mechanical slides on the salon breaker panel in the proper position, covering the shore power switches.
3. When power is available the green light above the switches illuminates.
4. Set the Generator switch to **ON.**
5. Set the Generator ***and*** Generator/Transfer switch to **ON.**
6. Turn the desired breakers **ON.**

Generator power is limited to total output of the generator. Exceeding this limitation will cause breakers to trip.

Figure 3-35. Salon Main Circuit Breaker Panel AC Section

The bottom section of the Salon Main Circuit Breaker Panel (Figure 3-32) controls the DC power system. This section receives it power feed from the Generator/House battery. The red master Generator battery switch must be turned **ON** and the Ship's Service circuit breaker turned **ON** condition to power this panel.

Figure 3-36. Salon Main Circuit Breaker Panel – DC Section

Troubleshooting the AC System

Table 3-6. AC Electrical Troubleshooting Chart

Problem	Cause	Solution
No AC power	Main breaker(s) tripped of OFF	Turn breakers ON or reset.
	Breaker(s) at main AC panel tripped or OFF	Turn breakers ON or reset.
	Shore power cord not securely connected	Check cord; plug in if necessary.
	Loose or disconnected wire(s)	Tighten connections, or refer to qualified marine electrician.
No power to AC devices	Breaker(s) at main AC panel tripped or OFF	Turn breakers ON or reset.
	Shore power cord not connected	Check cord; plug in if necessary.
	Loose or disconnected wire(s)	Tighten connections, or refer to qualified marine electrician.
	Ground fault interrupter tripped	Reset button on outlet and test.

AC Wiring Codes

Color codes identify wiring throughout the boat. The color codes for the AC system is as follows:

- Red – Source Conductors
  * Positive. All current carrying conductors between the batteries and first switch or load device in a circuit. Bus bars, circuit breakers, terminals, and fuses in the source conductor are not considered switches or load devices.
- Yellow – Negative Conductors
  * All current carrying AC negatives that terminate at their terminals.
- White – Load Conductors
  * All sheathing is White.
- Green – All Ground Conductors
- Non-current carrying grounding and bonding conductors.

There are several additional basic colors and color combinations for different circuits used beyond the ignition switch. Some of these colors can serve more than one type of circuit.

FUNCTION	WIRE COLOR
SHORE POWER 1	BLACK
LINE 1 NEUTRAL	WHITE
GALVANIC ISOLATOR L-1	GREEN
SHORE POWER 2	BLACK
LINE 2 NEUTRAL	WHITE
GALVVANIC ISOLATOR L-2	GREEN
GENERATOR POWER	BLACK
BATTERY CHARGER	RED
AIR CONDITIONER	BLACK
AIR CONDITIONER PUMP	BLACK
WATER HEATER	BLACK
COOKTOP RELAY	BLACK
COOKTOP	BLACK
GALLEY REFRIGERATOR	BLACK
GALLEY FREEZER	BLACK
COCKPIT ICEMAKER	BLACK
PORT OUTLETS	BLACK
STARBOARD OUTLETS	BLACK
SALON TELEVISION	BLACK
STEREO/TV	RED
MICROWAVE/COFFEE	BLACK
SHORE POWER 1 IN	BLACK
SHORE POWER GROUND	GREEN
SHORE POWER 2 IN	BLACK

Table 3-7. AC Wiring Codes (Continued)

Function	Wire Color
COOKTOP SWITCH	BLACK
BLACK MDP JUMPER	BLACK
RED MDP JUMPER	RED
WHITE MDP JUMPER	WHITE
GREEN MDP JUMPER	GREEN

Generator

For domestic delivery there are four different types of generators that can be fitted in the Corsair 36. Two are gasoline models and two are diesel models. There are also four models available for European delivery, two gasoline models and two diesel models.

When you take possession of your craft you are given all the technical documentation related to your boat. Within that documentation is the Owner's Manual for your generator. Since the number of generators vary, no one specific generator is discussed in this manual. Instead only basic rudimentary information common to all generators is presented here. Hence it is your responsibility to become familiar with the operation and maintenance of your generator.

All generators have one primary function: deliver AC electrical power to the boat.

The generator (Figure 3-33) is located in the engine compartment and accessed via the engine hatch.

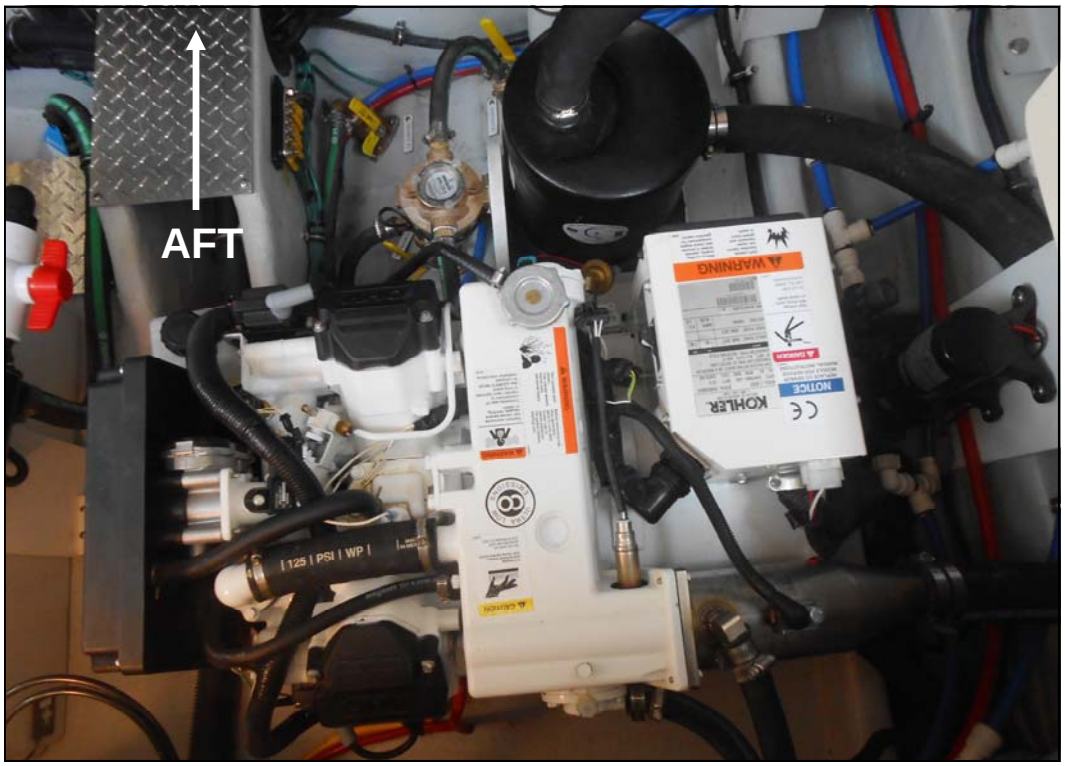


Figure 3-37. Kohler Generator

Generator Cooling System

The cooling system for the generator is a self-contained, closed circuit fresh water system using a sea water heat exchanger to keep the coolant at a constant temperature. The generator's Owner's Manual addresses the importance of cooling maintenance since many generator failures can be attributed to cooling system corrosion.

The coolant recovery tank allows for coolant expansion and contraction thus keeping the engine coolant at a constant temperature and preventing air from entering the system. Before operating the boat check the coolant level. If necessary refer to the Owner's Manual for instructions on how to fill and service the system.

Generator Operation

There are two ways of starting the generator: local and remote. The local switches are located on the generator itself. The remote switches are located on the Salon Main Circuit Breaker Panel. Local start and run switches are different between a gas driven generator and a diesel driven generator thus it is important to read and understand the Owner's Manual for your particular generator.

Emergency stop procedures for the gas and diesel driven generators are also different. It is imperative that you understand how to shut down the generator using the emergency procedure. These instructions are included in the generators Owner's Manual.

If you must shut down the generator using an emergency stop procedure under no circumstances restart the generator until the cause of the malfunction has been corrected.

Generator power is limited to total output of the generator. Exceeding this limitation will cause breakers to trip.

When using the generator always start it with no-load applied. Once the system is at operating temperature load the unit one system at a time. The generator is not designed to energize every system on the boat. Use circuits when applicable and turn off circuits when not in use.

Generator Starting

Start procedures are different for the gasoline and diesel models. It is important to refer to the generators Owner's Manual for complete information on starting and stopping the generator as only rudimentary information is repeated here.

Starting diesel generators:

There are four (4) switches and four (4) dials associated with the generator control panel. The four switches are:

1. Preheat switch. This is a spring-loaded switch which preheats the engine for easier starting. It also by-passes the protective oil pressure switch and provides power to the start switch. This switch energizes the Start switch.
2. Start switch. This is a spring-loaded switch used for starting the generator. It cannot be energized unless the Preheat switch is depressed.
3. Stop switch. This is a spring-loaded switch which must be depressed and held to stop the generator.
4. Emergency stop switch. This switch may or may not be present on your generator. The normal position of this switch is CLOSED. When depressed it opens the DC circuit of the control panel and shuts down the generator.

Since this switch is not spring-loaded it can be used to keep the generator off when performing maintenance. The four dials associated with the control panel are:

1. Water temperature gauge. Normal operating temperature should indicated a reading of 175° F to 195° F (80° C to 91° C).
2. Oil pressure gauge. The needle fluctuates depending upon load conditions.
3. DC voltmeter. This gauge indicates battery charge. Normal readings are 13V to 14V.
4. Hour meter. This indicates elapsed time put on the unit and is used for scheduling maintenance.

The remote start panel is located on the salon main circuit breaker panel. It contains the same switches as the generator control panel except for the Emergency Stop Switch. The remote start panel also contains a green LED but no gauges.

NOTICE

If the generator does not start within 10 to 20 seconds, release both switches, wait a minimum of 30 seconds, and repeat the start procedure.

Prestart:

1. Check cooling and lubricating levels as instructed in the Generator's Owner's Manual.
2. Ensure fuel feeds are open.
3. Open the generator cooling seacock.

To start the generator from the generator control panel:

1. Depress the Preheat switch. Preheat time is dependent upon ambient temperature. Refer to the generators Owner's Manual for the appropriate preheat time.
2. Keep the Preheat switch depressed, then depress the Start switch. When the engine starts release the Start switch. Do not release the Preheat switch until the oil pressure reaches 15.
3. Allow the engine to reach operating temperature before applying any load to the generator.

To start the generator from the salon panel:

1. Press the Preheat switch and hold.
2. Keep the Preheat switch depressed, then depress the Start switch.
3. Allow the engine to reach operating temperature before applying any load to the generator.

To stop the generator from either location:

1. Remove all electrical load from the generator. Allow it to run for another three to five minutes to stabilize the operating temperature.
2. Depress and hold the Stop switch until the generator comes to a complete stop. Release the Stop switch.

Starting gasoline generators:

There are two (2) switches associated with the generator control panel:

- The On switch
- The Start/Stop Switch

NOTICE

Never run the starter for more than twenty (20) seconds at a time. Damage may result.

If the engine fails to start, release both switches, wait a minimum of 30 seconds and repeat the start procedure.

Prestart:

1. Check cooling and lubricating levels as instructed in the Generator's Owner's Manual.
2. Ensure fuel feeds are open.
3. Open the generator cooling seacock.

To start the generator from the generator start panel:

1. Place the generator run switch to ON.
2. The generator start switch is spring-loaded. Press and hold the start switch to the Start position until the generator starts, then release. The center switch position then becomes the Run position.

To start the generator from the salon panel:

1. Move the On switch to the up (On) position and hold. The green light illuminates.
2. While holding the On switch in the On position, move the Start/Stop switch to the Start position and hold.
3. When the generator starts the starter disengages.
5. Release the Start/Stop switch. It is spring loaded to the center position.

To stop the generator from either location:

1. Move the Stop switch to the down (Stop) position, and hold momentarily.
2. Release the switch when the generator stops.

Compass

A compass is installed on each boat to aid in navigation. A magnetic compass is often deflected by iron, magnets, or electrical current from nearby wiring and must adjusted to compensate for these influences.

Only a qualified technician should perform compass adjusting/compensation. Since it is seldom possible to correct compass deviation to zero, a deviation card is created to indicate the correct heading that must be utilized when navigating by compass. Keep this card near the helm and refer to it as necessary.

Figure 3-38. Compass

Galley

The galley provides all the tools necessary to make your outing a success. Components of the galley include a microwave, coffee maker, sink, a single or dual burner cooktop, refrigerator, trash receptacle, and storage compartments.

Most of the components in the galley require AC power to operate, but the galley refrigerator can be operated on either AC or DC power.

Each component comes with an Owner's Manual included with the boats technical documentation

Figure 3-39. Electrical Panel

Figure 3-40. Coffee Maker

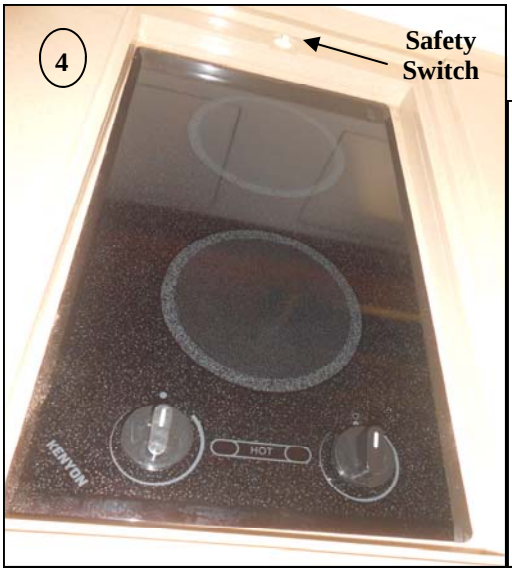


Figure 3-41. Cook Top

For safety, the cook top contains a safety switch which shuts off power to the unit when the cover is installed.

Figure 3-42. Galley

Figure 3-43. Galley Sink

These numbers describe the items located in the galley. See pages 3-52 and 3-53.

1. Electrical Panels
2. Microwave Oven
3. Coffee Maker
4. Cooktop Stove
5. Galley Sink
6. Refrigerator
7. Trash Bin

Figure 3-44. Galley Refrigerator

Figure 3-45. Trash Receptacle

Entertainment and Convenience Equipment

There are numerous entertainment options available for the boat. In general, entertainment equipment consists of a standard in-dash AM/FM stereo CD with speakers and an in-dash remote control.

Figure 3-46. Cockpit Stereo

The system is designed to be waterproof to endure the harsh elements of boating. Included with the boat is an instruction manual that details the proper use and care of the system.

The cockpit refrigeration system (Page 3-55) consists of a 12VDC cold plate with adjustable thermostat. When operation on the DC power the engine or battery charger must be running to prevent the batteries from being depleted. An instruction manual located in the important papers packet details the proper use and care of the system.

An optional cockpit icemaker is also available for the Corsair 36. The included owner's manual details the proper use and care of the system.

Figure 3-47. Wet Bar and Sink

Figure 3-48. Cockpit Refrigerator

The transom shower is a convenience option for a quick rinse-off after a swim.

Figure 3-49. Transom Shower Head

Windlass

The windlass is controlled by a switch on the helm. The windlass is a DC powered system and protected by a circuit breaker on the Battery Switch Panel. The Starboard Engine Red Master Switch must be energized for the system to operate.

The windlass compartment, located at the bow, contains a fresh water wash down allowing you to rinse the chain as it retracts. Before operating the windlass, ensure the safety lanyard is disconnected from the anchor. The windlass can be operated remotely by a handheld device which plugs into the receptacle near the windlass.

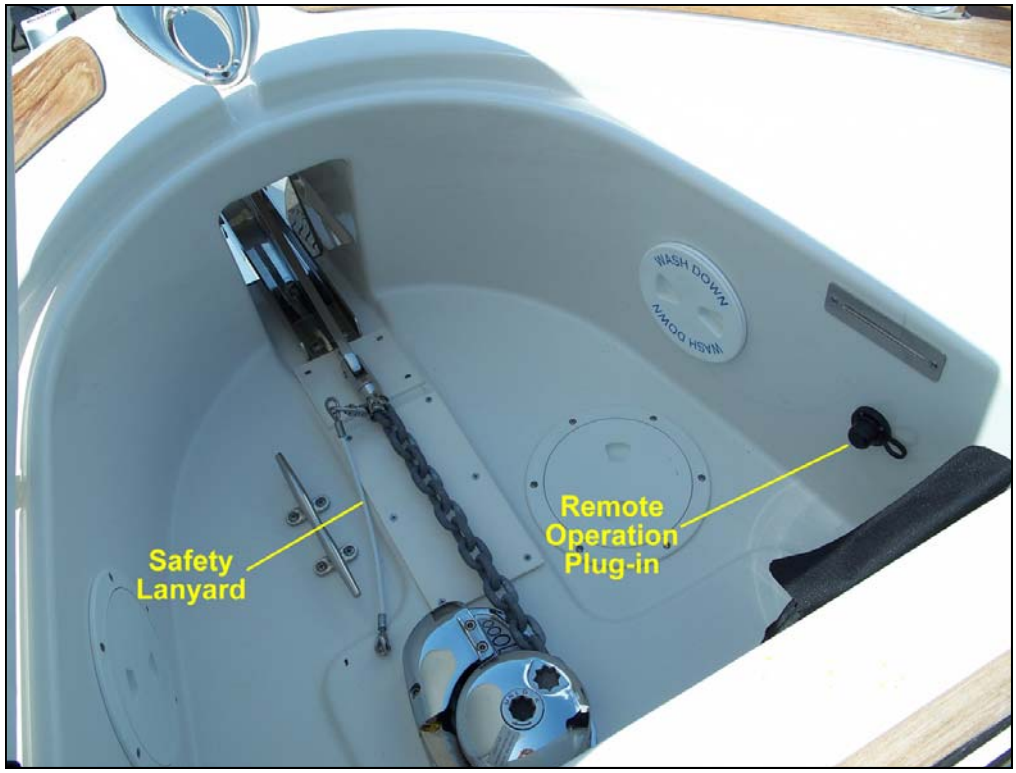


Figure 3-50. Windlass Compartment

Marine Tops And Covers - Care And Cleaning

sunbrella®

One of the best ways to keep Sunbrella® fabrics looking good and to delay the need for deep or vigorous cleaning is to hose fabrics off on a monthly basis with clear water. This practice will help prevent dirt from becoming deeply embedded in the fabric and eliminate the need for more frequent vigorous cleaning. In most environments, a thorough cleaning will be needed every two to three years.

When it's time for a thorough cleaning, Sunbrella fabrics can be cleaned while still on a boat or, size permitting, they can be removed for cleaning in a washing machine or dock side. When cleaning Sunbrella fabrics, it is important to observe the following:

- Always use a mild detergent such as Woolite or Dawn dishwashing liquid.
- Water should be cold to lukewarm.
- Rinse thoroughly to remove all detergent residue.
- Air dry only. Never apply heat to Sunbrella fabrics.

General or light cleaning

To clean Sunbrella while still on a boat, follow these simple steps:

- Brush off loose dirt.
- Hose down.
- Prepare a cleaning solution of water and mild detergent such as Woolite or Dawn.
- Use a soft bristle brush to clean.
- Allow cleaning solution to soak into the fabric.
- Rinse thoroughly until all detergent residue is removed.
- Air dry.
- May not require re-treatment depending on the age of the fabric.

If stubborn stains persist, you can use a diluted chlorine bleach/detergent mixture for spot cleaning of mildew, roof run-off or other similar stains (see our Stain Chart for specific recommendations).

Heavy cleaning for stubborn stains and mildew

Sunbrella fabric does not promote mildew growth, however, mildew may grow on dirt and other foreign substances that are not removed from the fabric. To clean mildew, or other stubborn stains:

- Prepare a solution of 1 cup bleach and 1/4 cup of mild detergent per gallon of clean water.
- Soak affected area in solution for 15 minutes.
- Remove stain with a sponge or clean towel.
- Rinse thoroughly to remove all detergent residue.
- Air dry.

Remember to protect the area around your Sunbrella fabric if using a bleach solution. Carpet or other fabrics that are not Sunbrella may have an adverse reaction to the bleach. If a boat cover is suitable in size for a washing machine, these steps should be followed:

- Use mild detergent.
- For heavier stains add 1 cup of bleach to wash.
- Wash and rinse in cold water.
- Air dry. Never apply heat to Sunbrella.
- Re-treatment for water and stain resistance will be necessary after machine washing.

Re-treating the fabric

As part of the finishing process, Sunbrella fabrics are treated with a fluorocarbon finish, which enhances water repellency. This finish is designed to last for several years, but must be replenished after a thorough cleaning. Based on test results, Glen Raven recommends 303 High Tech Fabric Guard™ as the preferred re-treatment product for Sunbrella fabrics. Fabrics should be re-treated after thorough cleaning or after five years of use.

For more information on re-treatment products, please visit www.303products.com.

Helpful hints

Protect the area around the Sunbrella fabric when using a bleach solution – bleach may discolor non-Sunbrella fabrics. Always rinse Sunbrella thoroughly to completely remove bleach.

Please be aware of the environment when cleaning with bleach. Bleach can have harmful effects on the natural environment around you. We do not advise using bleach if you are surrounded by a body of water or other environment that could be affected.

Sunbrella air dries very quickly. Machine drying is not necessary.

If fabric has some wrinkling, use an iron, if necessary, but only on the synthetic setting. As some irons exceed the recommended temperature on the synthetic setting, test a small inconspicuous area before ironing entire piece.

DO NOT use a steamer or iron set to steam setting.

Use of bleach and/or advanced age of the fabric application may impact the deterioration of the sewing thread and other non-Sunbrella components.

Applying 303 High Tech Fabric Guard

303 should be applied to Sunbrella fabrics after each thorough cleaning, which typically removes the original finish and reduces the fabric's water repellency.

- Clean Sunbrella fabric, using one of the cleaning methods.
- Allow Sunbrella to completely air dry.
- Apply 303 Fabric Guard in a well ventilated area following instructions on the container.
- Apply 303 in a thin, even coat and allow fabric to dry completely.
- Apply a second thin, even coating of 303. (Two light coatings are more effective in restoring fabric water resistance than a single heavy coating. A 15-ounce bottle provides coverage of up to 50 square feet of fabric.)

You may have access to professional cleaning firms. In evaluating the services of a professional firm, you should inquire about a firm's experience in working with Sunbrella fabrics and knowledge of cleaning and re-treatment requirements.
DO NOT dry clean Sunbrella fabrics.

Figure 3-51. Canvas Top

Cleaning and Maintenance of Teak

Things You Will Need	
Soap Flakes	Teak or Tung Oil
Sponge	Rags
Fresh Water Hose	Paint Brush
Teak Cleaner	Sandpaper

Instructions

1. Treat the wood with general care and attention. As hard and durable as teak is, it is also sensitive to stains and damage which can permanently mar its surface. Keep flames, chemicals and even black-soled shoes away from the wood's surface to prevent irreparable damage.
2. Spray the surface with water. Use a fine jet of water to clean the teak's surface of loose dirt and grime. A garden hose will provide sufficient water pressure for this initial cleaning process.
3. Clean the wood with special teak cleaner. There are a number of high quality teak cleaners on the market. Use a cleaner like Amazon teak cleaner to do a thorough cleaning. Dilute the cleaner as directed by the label and then use a non-metallic brush to scrub the cleaner into the wood. Rinse the surface thoroughly afterwards.
4. Let the teak dry for 24 hours. If the teak is the color you want it after cleaning then move on to the next step. If the color is too dark then give the wood another cleaning.
5. Finish the process with a teak oil. Teak oils are specially designed products to keep the teak strong and beautiful. Use an oil such as Teak Guard or Amazon's Teak Oil to treat the teak with oil. Apply the oil to a clean and dry teak surface by wiping the wood with a rag soaked in the oil. Apply as many coats as the label of the product directs or until the teak has acquired the color you want.

Maintenance and Cleaning Of Stainless Steel

GG Schmitt & Sons
MARINE HARDWARE
Designers and Manufacturers Since 1951

STAINLESS STEEL CARE & MAINTENANCE

Austenitic Stainless Steels as used in Marine applications, contrary to popular beliefs, are not completely free from corrosion attack. The degree of surface oxidation is directly affected by local atmosphere and saltwater concentrations. All metals are subject to corrosion in some environments. The choice then is one of economics or optimum performance. Gold would be an exceptional material, but…practicality leads us to the non-magnetic High Chrome – Nickel grades of Stainless Steels. These alloys in the Wrought condition have proven to be the most versatile in the "Above Water" Marine environments. Many factors contribute to corrosion and the protection from corrosion. The most noteworthy is the special characteristic that Stainless Steel has in its ability to form its own anti-corrosive coating, through an adherent oxide passive film. This natural resistance can only be accomplished in a clean, contaminant free and oxygen present surface.

Our most helpful recommendation then is to give your Stainless Steel Hardware the same attention you would other materials on your boat. Regular fresh-water washing with a mild abrasive cleaner will keep your Stainless bright and beautiful and should last far beyond the life of the boat.

DEDICATION TO QUALITY

Our assurance of consistently high quality marine hardware goes far beyond the statement alone. From original raw material procurement and its certification, we follow strict standards throughout the complete manufacturing process with rigid inspections to final packaging. Each product has been thoroughly tested for its strength and dependability in the design and development stage. It is then routinely sample tested on production runs.

Quality Control is our Highest Priority

1 *ALWAYS* clean stainless frequently with soap and water. Any cleaner safe for glass is usually safe for stainless.

2 *ALWAYS* remove rust spots as soon as possible with a brass, silver, or chrome cleaner. Irreversible pitting will develop under rust that remains on stainless for any period of time.

3 *ALWAYS* use a cleaner, like a good car wax, for added beauty and protection.

4 *NEVER* use course abrasives like sandpaper or steel wool on stainless. These may actually cause rusting.

5 *NEVER* clean with mineral acids or bleaches.

6 *NEVER* leave stainless in contact with iron, steel, or other metals which cause contamination leading to rust or corrosion.

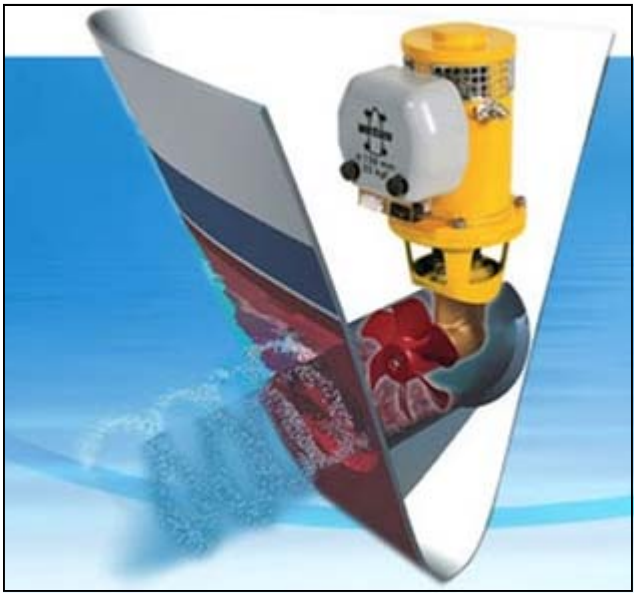


Figure 3-52 Bow Thruster

Your boat may be equipped with a bow thruster which will allow you to dock with confidence, control & composure. Even skilled skippers need an extra hand battling sudden wind shifts, strong currents or congested marina docking assignments. Thrusters inspire docking confidence and provide a gentle push that you will control - away from or to the dock or seawall. If you have not experienced using a bow thruster it is recommended that you are checked out by the dealer on how to use this feature.

Figure 3-53 DC Power Source

Figure 3-54 Bow Thruster Joy Stick

Figure 3-55 Bow Thruster

Procedure to activate the bow thruster's joystick:

- Power Switch to ON position.
- Depress the Power Button on the Joy stick for five seconds.
- There should be an audio alarm sounding during this operation.
- Release the button.

Control Panels for Bow and Stern Thrusters

Control panel features:

- Built-in time lapse device when reversing the direction of rotation.
- Automatic switch off after 30 minutes inactivity.
- In the event of continuous running for more than 2 minutes there is an LED and buzzer alert, along with automatic shut off.
- The panel will reset itself after 5 seconds.

How To Clean Clear Vinyl Eisenglass Boat Windows

Clear Vinyl Roll and Sheet windows

Routine Cleaning:

-Rinse off loose dirt and particles with clean fresh water.

-Fill a clean bucket with fresh water and add a mild, non-detergent soap such as ***EisenClean***. Check the soap instructions for the proper amount. Although EisenClean is designed for cool water use most marina's don't provide hot water, it will clean with warm water just as well.

-Wash the windows by wiping them with a soft cloth, towel or washing mitt and soap/water solution.

-Rinse thoroughly in the same manner with clean fresh water and a clean cloth.

-Dry the eisenglass with a clean absorbent cloth or towel to prevent water spots.

-Now the windows are ready for a UV protectant and/or polish.

DO NOT:

-Do not use window cleaner Windex, detergent soap, dish soap, fantastic, simple green or any other cleanser on clear vinyl boat windows. These chemicals break down the plasticizers and UV inhibitors that prevent yellowing, hazing and cracking.

-Do not use paper towel or anything abrasive to wipe the windows they will scratch.

DO:

-Only use a mild non-detergent soap such as EisenClean and/or products that are specifically labeled for use on clear vinyl boat windows or eisenglass.

-Frequently apply a specialized polish and/or UV protectant after cleaning to maintain clarity and prevent sun damage such as 303 Aerospace Protectant or Plexus.

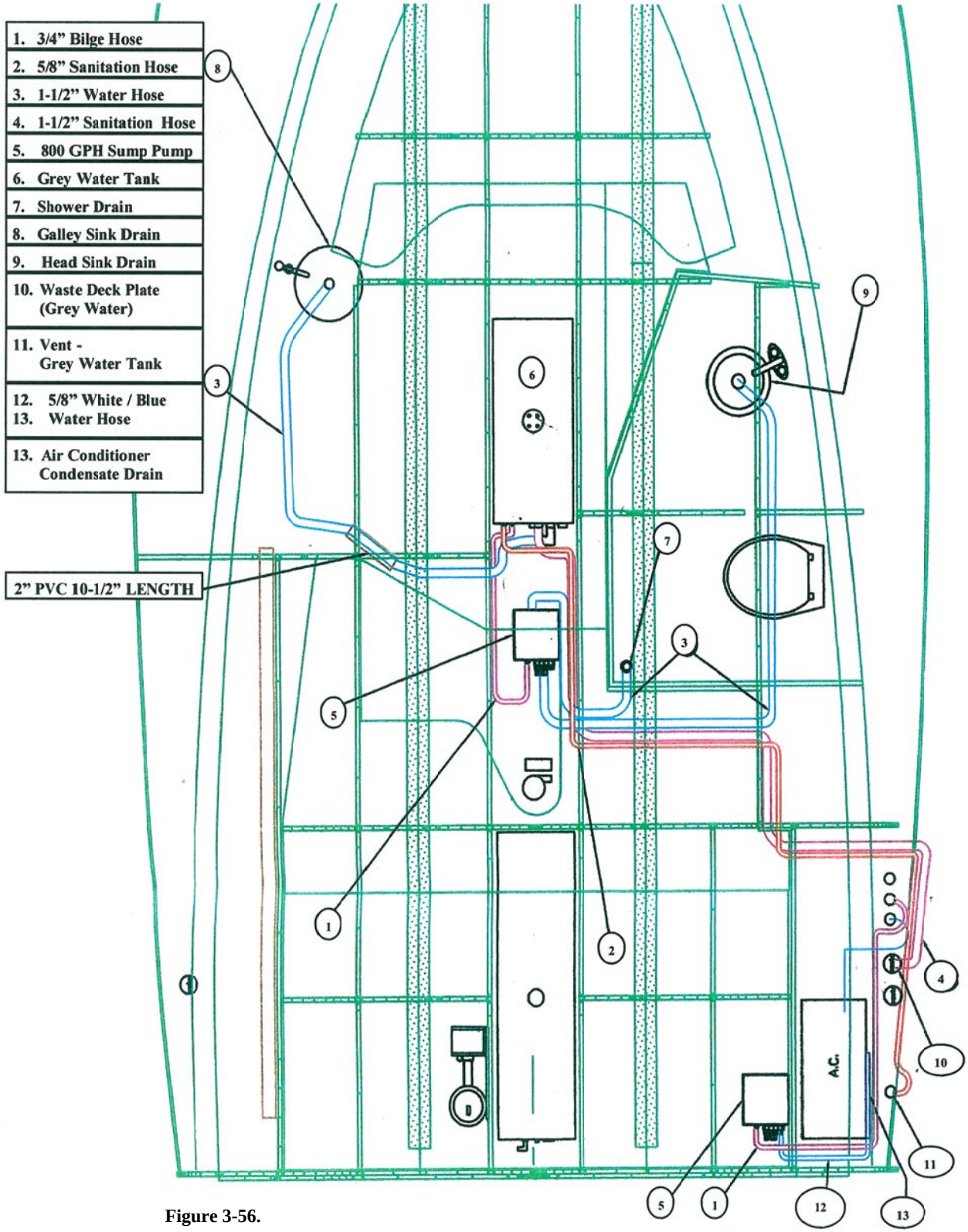
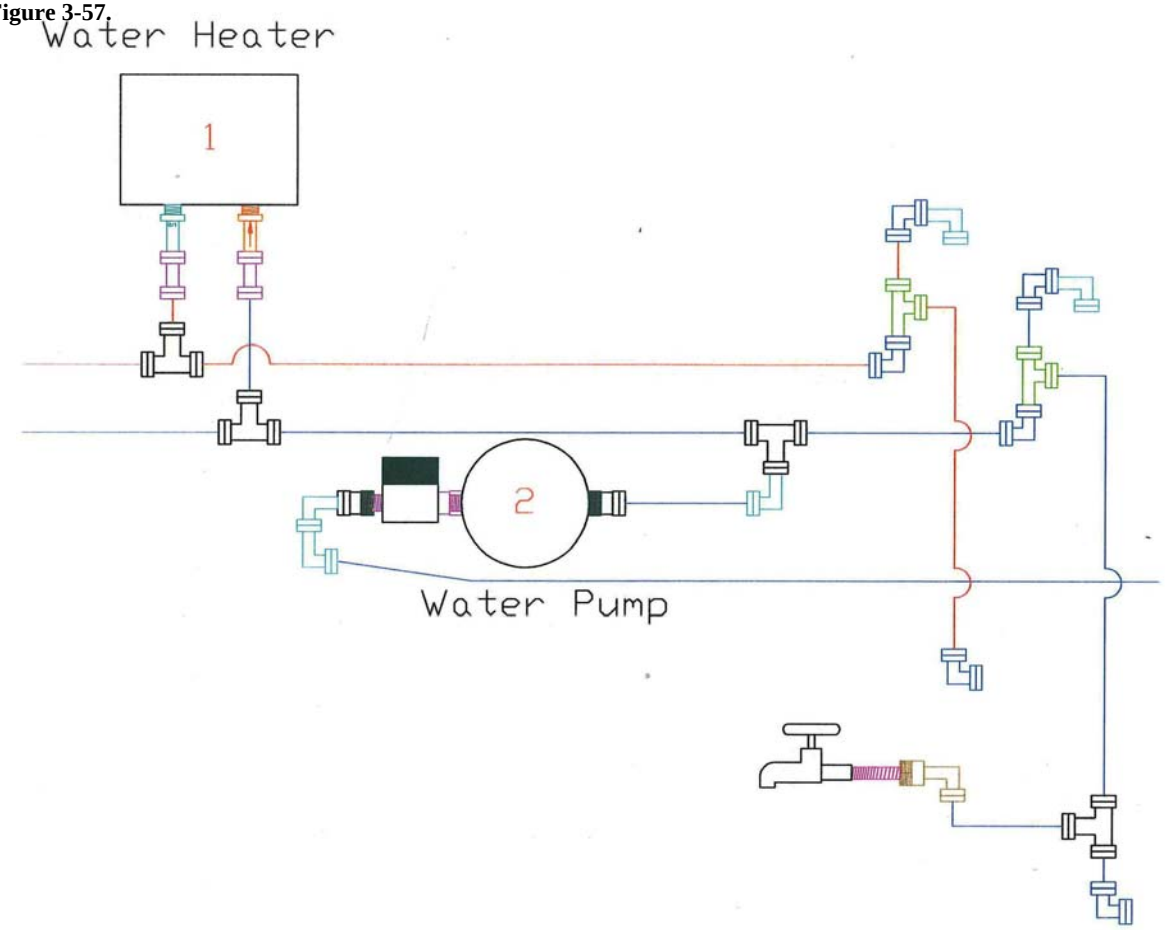

1. 3/4" Bilge Hose
2. 5/8" Sanitation Hose
3. 1-1/2" Water Hose
4. 1-1/2" Sanitation Hose
5. 800 GPH Sump Pump
6. Grey Water Tank
7. Shower Drain
8. Galley Sink Drain
9. Head Sink Drain
10. Waste Deck Plate (Grey Water)
11. Vent - Grey Water Tank
12. 5/8" White / Blue 13. Water Hose
13. Air Conditioner Condensate Drain
2" PVC 10-1/2" LENGTH
A.C.

Figure 3-56.

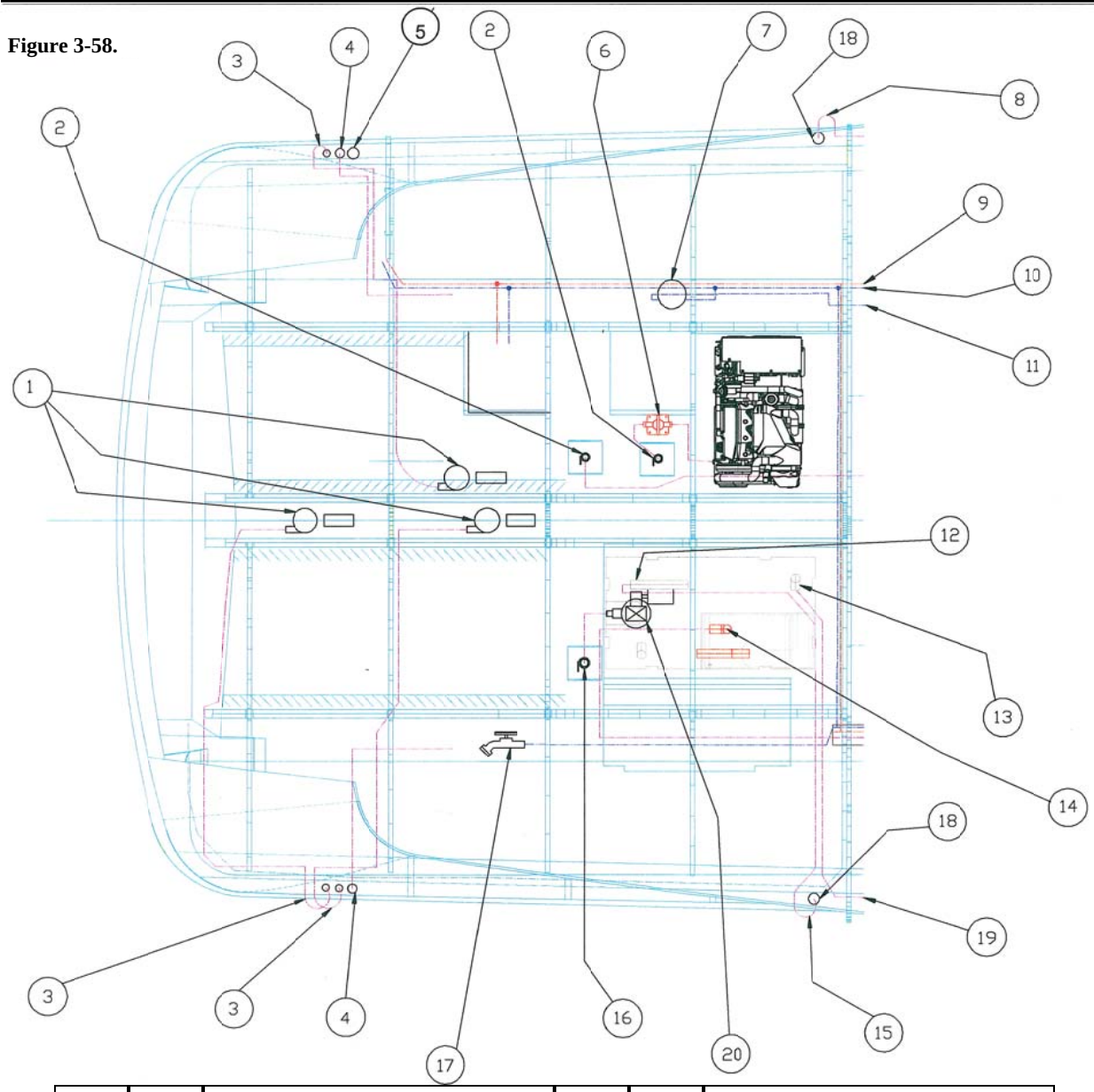
DETAIL OF THE POTABLE WATER SYSTEM IN THE

Figure 3-57.



ITEM	QTY	DESCRIPTION
	1	Elbow, 15 mm WX1503B
	4	Tee, Equal 15 mm
	2	Adapter, Straight 15 mm
	9	Elbow, Stem 15 mm
	1	Elbow, Adapter 1/2” BSP
	1	Nipple, 3/4”
	2	Adapter, Female 1/2” BSP
	1	Strainer, Water Shurflo
	2	Tee, Stem WX1521B
	2	Adapter, Stem NRV 1/2” MPT
	1	Washdown Faucet
	1	Adapter, Stem 1/2” MPT
1	1	Heater, Water 6 Gallons
2	1	Pump, Shurflo Extreme Smart Sensor

Figure 3-58.



ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
1	3	2000 GPH Bilge Pump	12	1	Sanitation System Vent Filter
2	2	3/4" Sea Cock Valve	13	x	Sanitation System Dockside Discharge
3	3	1-1/8" Thru-Hull Stainless Steel	14	x	Vacuum Generator Inlet
4	2	1-1/2" Thru-Hull Stainless Steel	15	x	5/8" Sanitation Vent Hose
5	1	2" Thru-Hull S.S. (Generator Exhaust)	16	1	1" Sea Cock Valve (Optional)
6	1	3/4" Sea Strainer (Generator)	17	x	Faucet S.S. Bilge Wash Down
7	1	Water Pressure Pump	18	x	Vent Tank Stainless Steel
8	X	Vent Hose From Water Tank	19	x	To Waste Deck Plate
9	X	Red Water Tubing (Pressurized)	20	x	Overboard Macerator Pump (Optional)
10	X	Blue Water Tubing (Pressurized)			
11	X	Blue Water Tubing (Non-Pressurized)			

⚠ WARNING

OVERBOARD DISCHARGE OPERATION

OPERATE IN ALLOWED AREAS ONLY. WHEN OPERATING YOUR BOAT IN A U.S. NO DISCHARGE ZONE THE SEACOCK MUST BE SECURED IN A CLOSED POSITION. CHECK WITH U.S.C.G. OR LOCAL AUTHORITIES FOR GUIDELINES.

IF YOUR BOAT IS FITTED WITH AIR CONDITIONING, DO NOT RUN THE AIR CONDITIONING WHEN THE WASTE DISCHARGE SECOCK IS OPEN.

Figure 3-59. Shows waste tank, macerator pump, shut-off valve and the macerator seacock.

Figure 3-60. Shows fill hose, vent hose and filter, shut-off valve, macerator pump and generator.

Figure 3-61. Shows path of the vent hose and filter with the vent hose going to thru-hull vent fitting.

Figure 3-62. Shows that the thru hull seacock is clearly marked and accessible.

Figure 3-59.

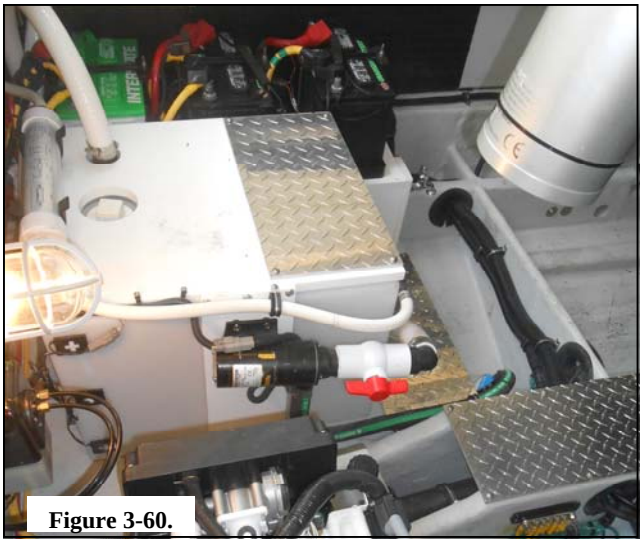


Figure 3-60.

Figure 3-61.

Figure 3-62.

!DANGER! Risk of Electrical Shock or Electrocution!

This underwater light must be installed by a Licensed Marine Electrician in accordance with ABYC (American Boat and Yacht Council), NMMA, and any other applicable standards. Improper installation will create an electrical hazard which could result in death or serious injury to swimmers, installers, or others due to electrical shock, and may also cause damage to property. Always disconnect the power to the light at the circuit breaker before servicing the light. Failure to do so could result in death or serious injury to serviceman, swimmers or others due to electrical shock.

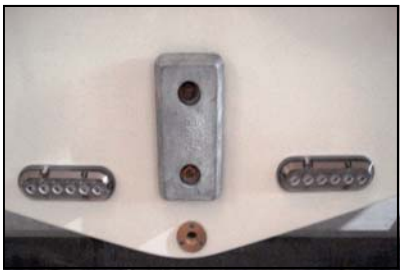


Figure 3-63.

WARNING Salt is an inherently corrosive material. Metal parts and certain natural and man-made surfaces are particularly susceptible to corrosion and deterioration when used in and around salt water. Ocean LED Amphibian Lights are 99.9% plastic and polymer products and impervious to salt water corrosion, however, screws and fasteners used for the installation must be of a marine grade type stainless steel or equivalent ***and monitored annually to ensure the lights remain in service for years to come.***

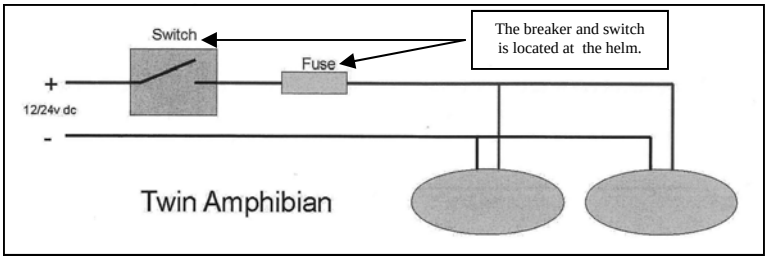


Figure 3-64.

WARNING

Always test the lights ***BEFORE*** the boat goes back into the water. Your Ocean LED underwater light installations require the boat to be hauled out of the water to replace light units.

Cleaning Instructions

Sea growth can collect quickly on the light and this can reduce the performance in just a few weeks. To prevent the build- up of sea growth, all Ocean LED lights have been coated with a specialized Tritonium coating which makes the surface of the glass lens a non-stick layer which helps ward off long term barnacle buildup. Lights should be cleaned with a boat brush or similar biweekly or as needed to keep the lens of the light clear. Growth varies greatly around the world and maintenance is imperative to the proper operation and longevity of the product. If heavy fouling occurs, barnacles can be removed from the lens
using a plastic scraper and moderate pressure. This can be done in the water using a plastic scraper.

CAUTION: Harsh cleaning solvents may damage the light.

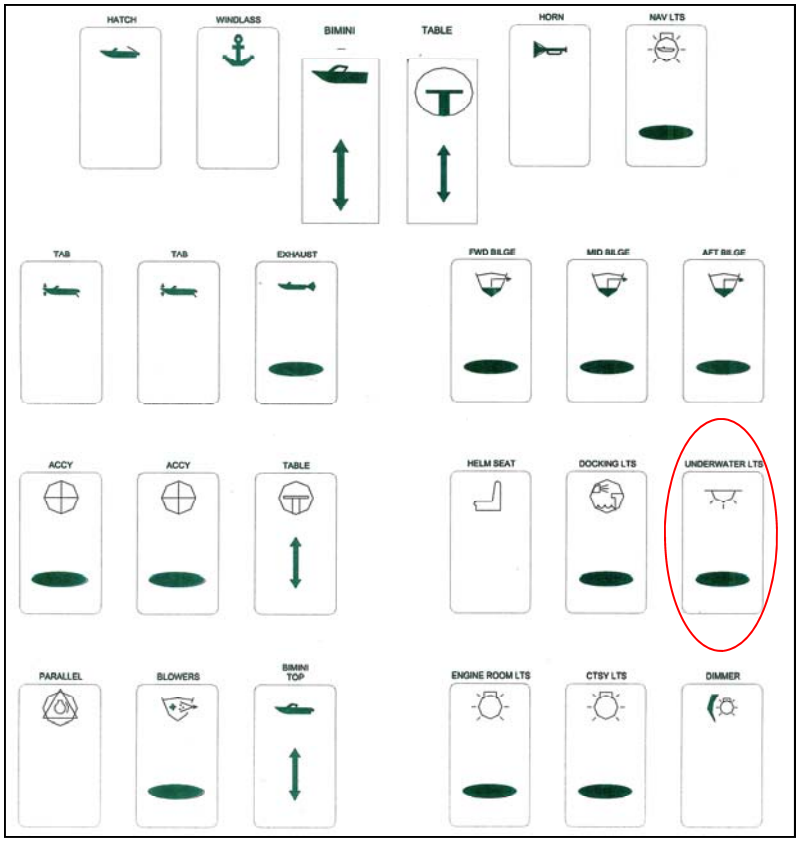


Figure 3-65. RH Switch Panel

Figure 3-66.

Figure 3-67.

Figure 3-68.

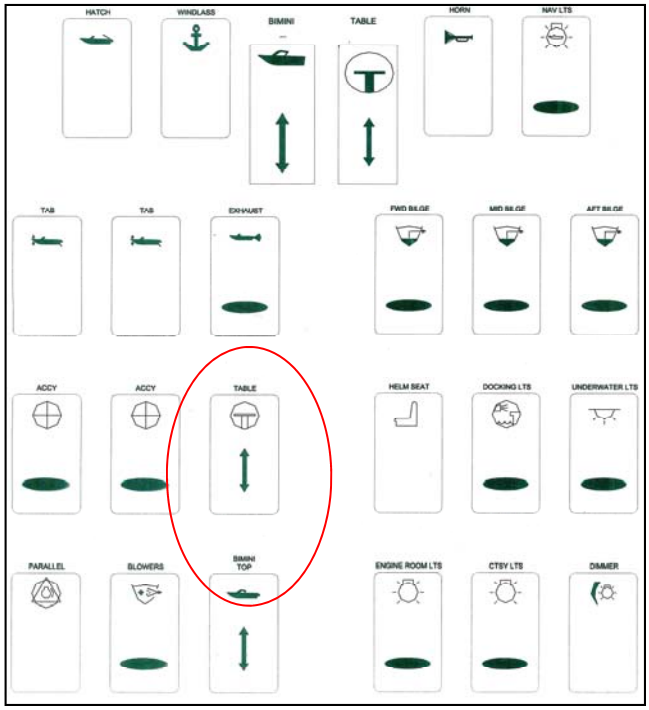


Figure 3-69.

Figure 3-70.

In the event of a dead battery it will be possible to open the engine hatch by attaching jumper cables to the battery posts located directly below the helm seat.

⚠ WARNING

NEVER REVERSE THE POLARITY ON THE BATTERY POSTS SEVERE DAMAGE WILL OCCUR TO THE CONTROL BOX OPERATING THE LIFTING RAMS

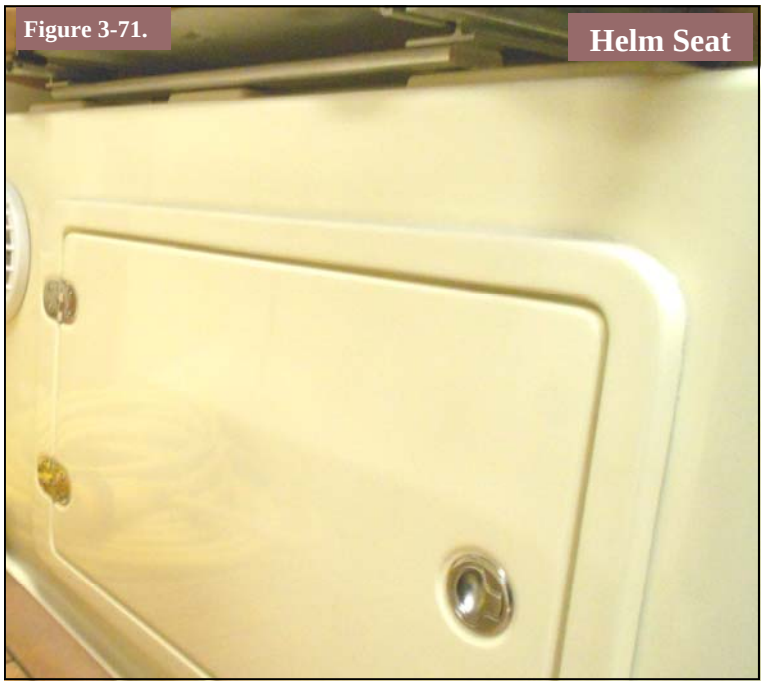


Figure 3-72.

Figure 3-73

The outlet in the head is GFI protected because it draws it's power from the GFI outlet at the helm station.

WARNING

Figure 3-74.

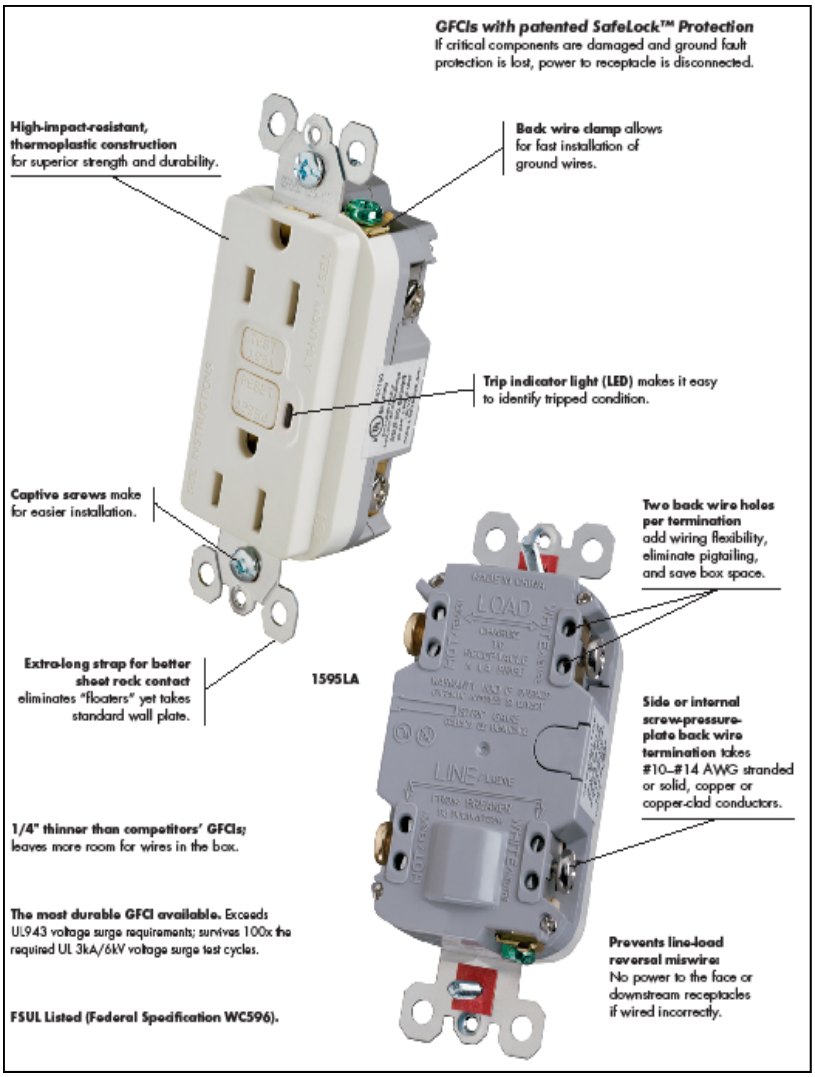


Figure 3-75.

Figure 3-76

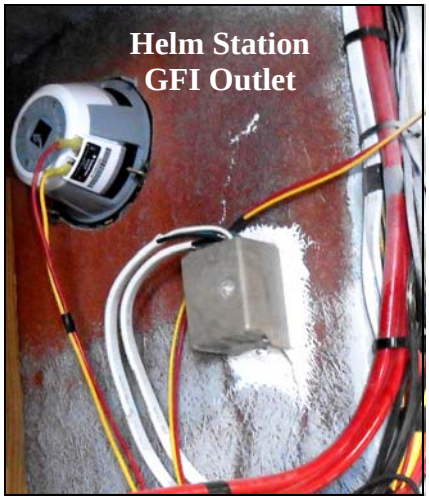


Figure 3-77

Important information

The installation manual for the air conditioning unit is contained on a CD located in the important papers pouch.

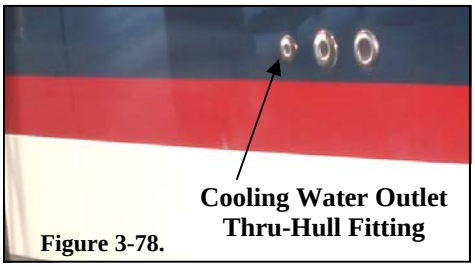


Figure 3-78.

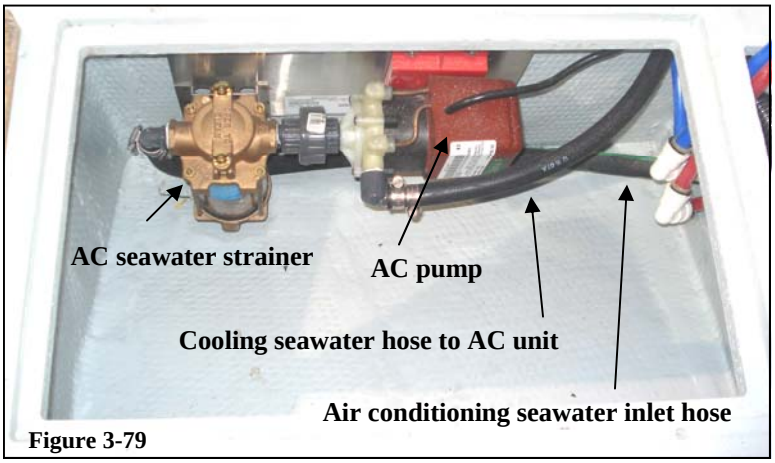


Figure 3-79

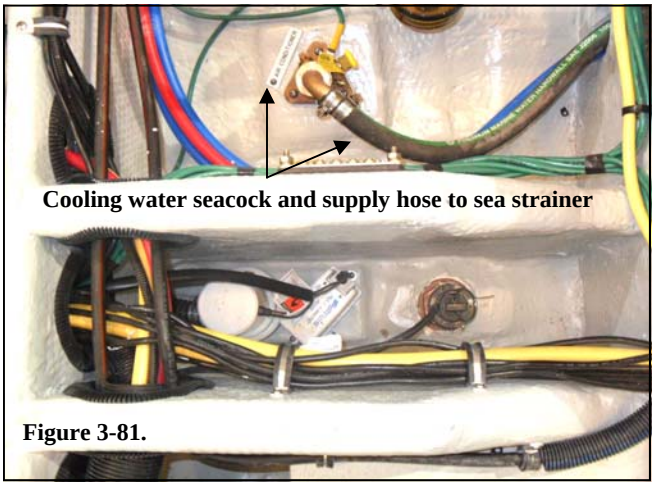
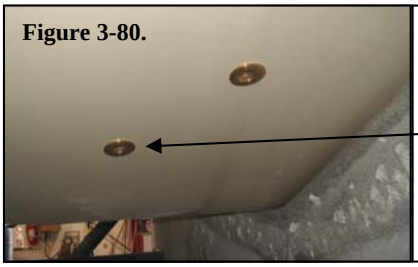


Figure 3-81.

Figure 3-80.



Air conditioning cooling water is picked up at this point.

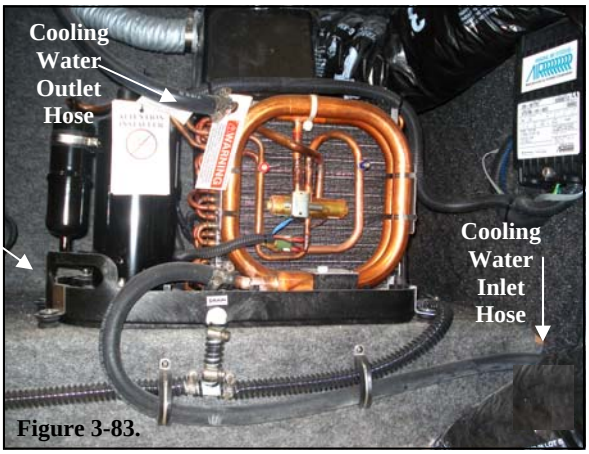
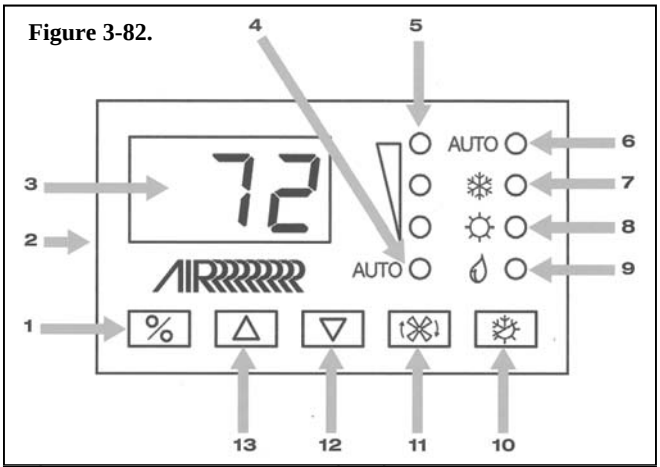


Figure 3-83.

Figure 3-82.



1	Power button	8	Heat Mode indicator
2	Temperature sensor	9	Moisture Mode indicator
3	Digital display	10	Mode button
4	Auto Fan indicator	11	Fan button
5	Manual Fan indicator (high, medium, low)	12	Down button - Lower temperature set point
6	Auto Mode indicator	13	Up button - Raise temperature set point
7	Cool Mode indicator		

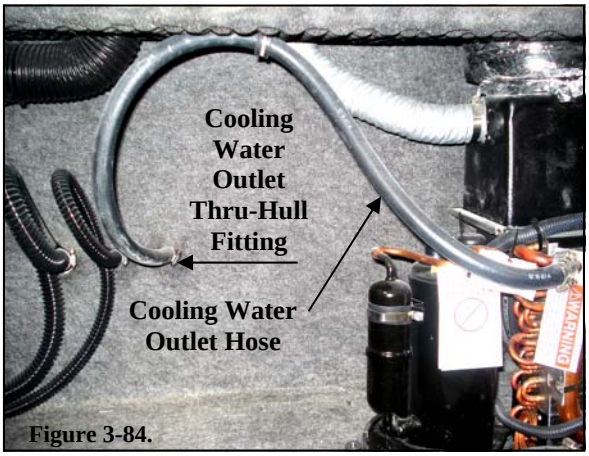


Figure 3-84.

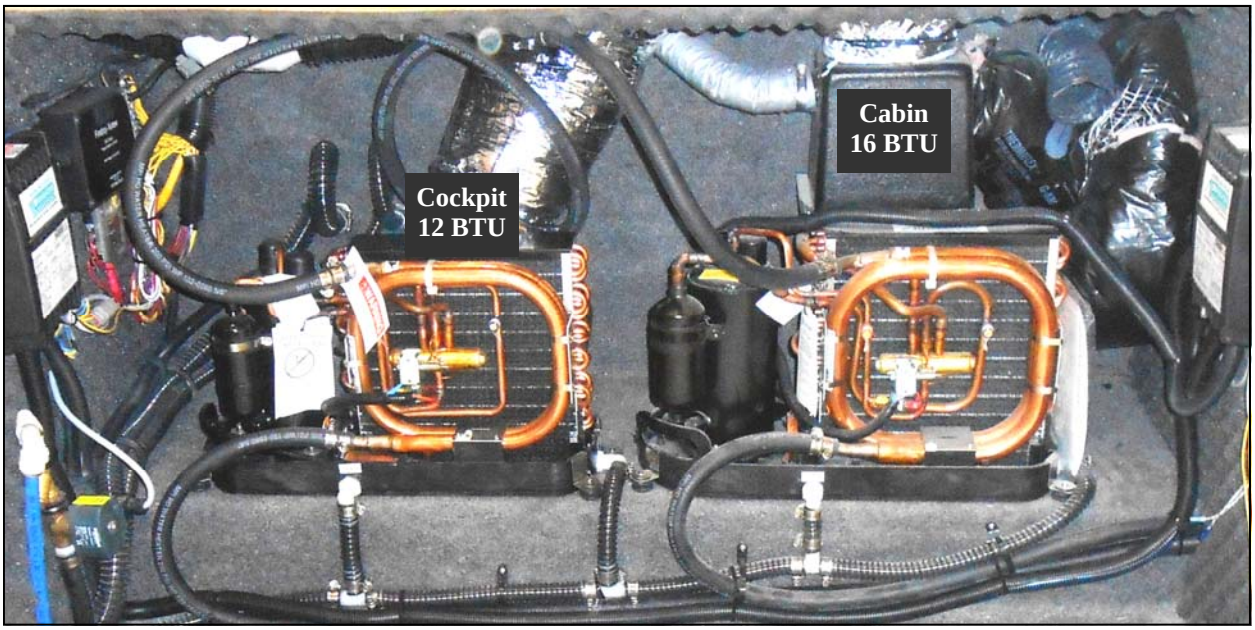


Figure 3-85

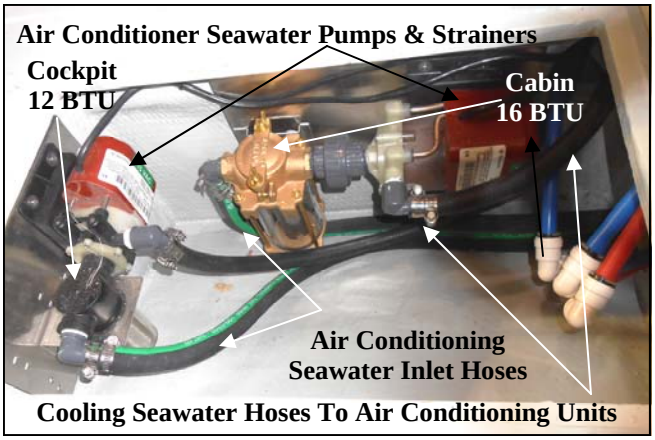


Figure 3-86

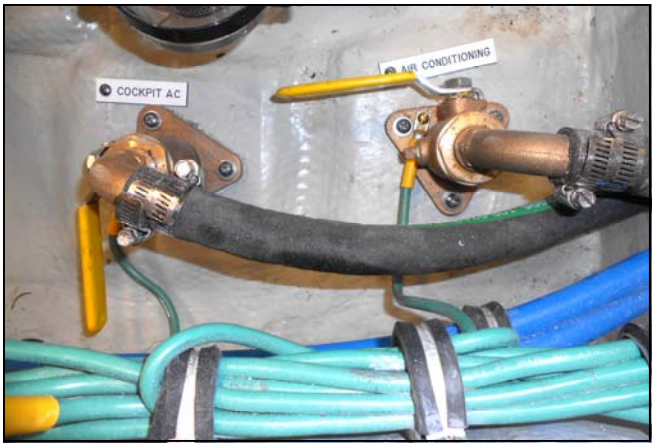


Figure 3-87

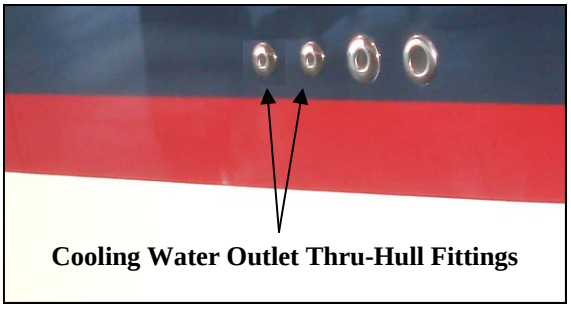


Figure 3-88

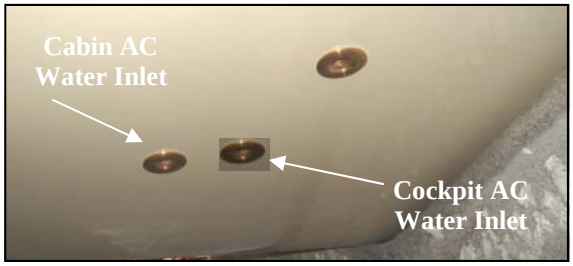


Figure 3-89

Important information

The installation manual for the air conditioning units are contained on a CD located in the important papers pouch.

The cabin air conditioner is 16 BTU. The cockpit air conditioner is 12 BTU.

Figure 3-90

(2 Each) Cooling Water Outlet Thru-Hull Fittings

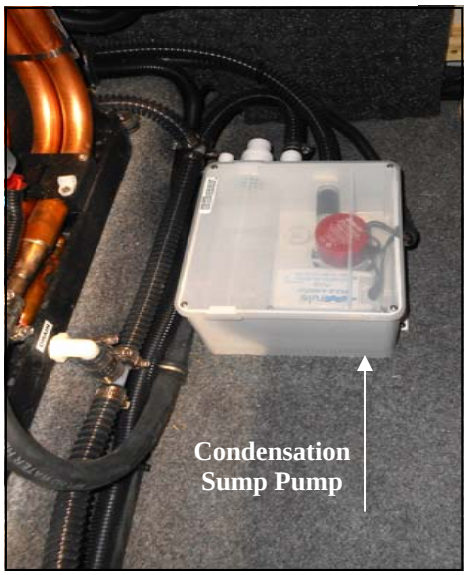
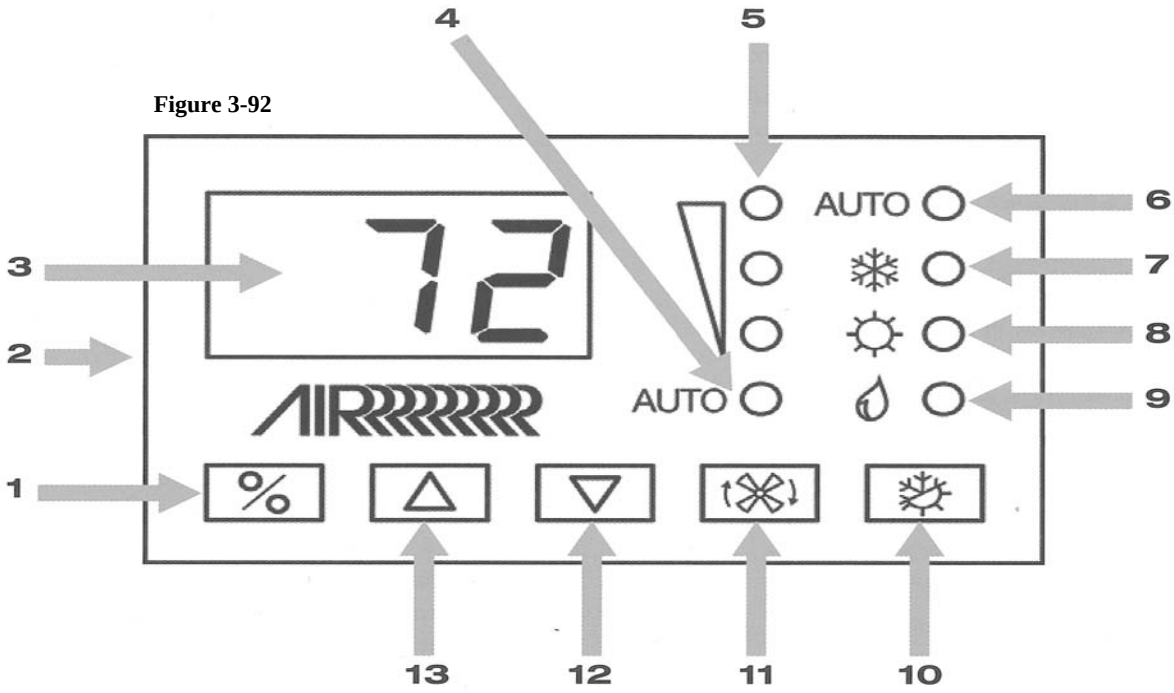


Figure 3-91.

Figure 3-92



1	Power button	8	Heat Mode indicator
2	Temperature sensor	9	Moisture Mode indicator
3	Digital display	10	Mode button
4	Auto Fan indicator	11	Fan button
5	Manual Fan indicator (high, medium, low)	12	Down button - Lower temperature set point
6	Auto Mode indicator	13	Up button - Raise temperature set point
7	Cool Mode indicator		

WARNING

DO NOT RUN THE BOAT ABOVE IDLE SPEED WHEN THE SUN SHADE IS EXTENDED. THIS WILL CAUSE DAMAGE TO THE SHADE.

WARNING

DO NOT USE THE SUN SHADE FOR A HAND HOLD. THIS COULD LEAD TO PERSONAL INJURY AND DAMAGE TO THE SHADE.

Sun Shade Retracted

Figure 3-93.

Sun Shade Extended

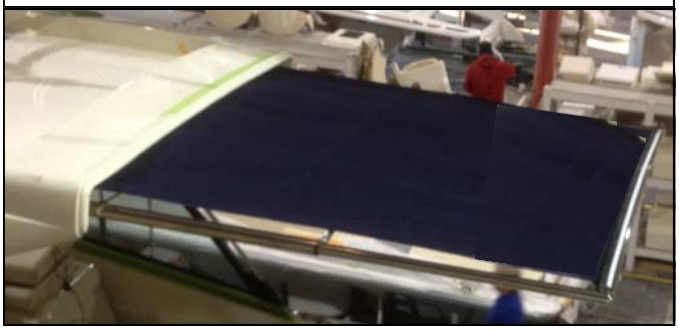


Figure 3-94.

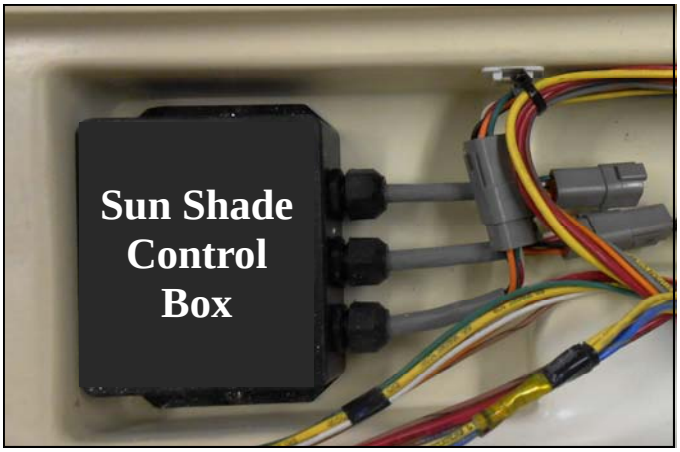


Figure 3-95.

Inboard Section Of The Helm Switch Panel

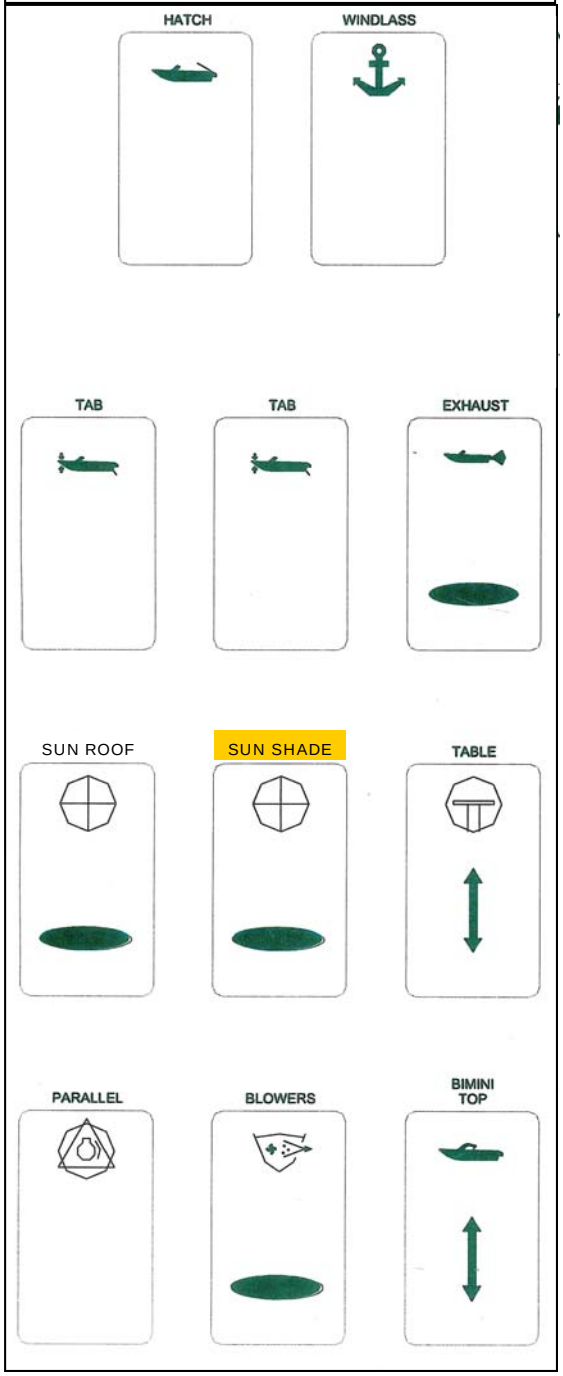


Figure 3-96.

WARNING

Do not put any limbs out of the hatch when closing the roof.

WARNING

The sliding hatch is not designed as a walking surface.

WARNING

The 36 Corsair hard top is not intended to be used as a platform to sit on, stand on or walk on.

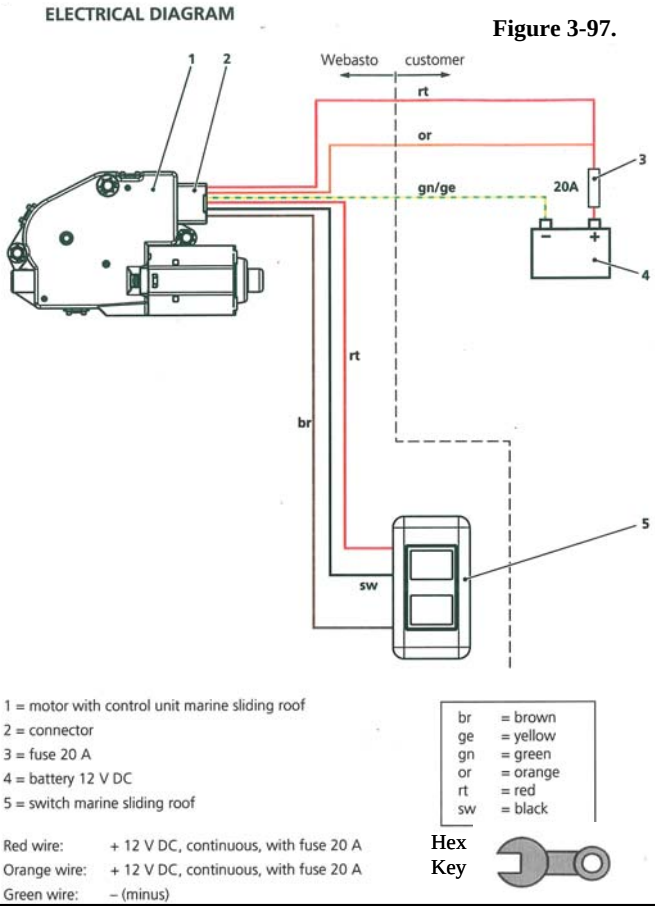


Figure 3-97.

When necessary, the marine sliding roof can be operated manually. The driving shaft of the motor can be turned with a hex key to open or close the roof.
Important: When operating the roof manually, do not operate the roof electrically with the switch!

WARNING

WARNING

Sliding roof must not be used as escape hatch. Make sure that another hatch is accessible for emergencies.

Inboard Section Of The Helm Switch Panel

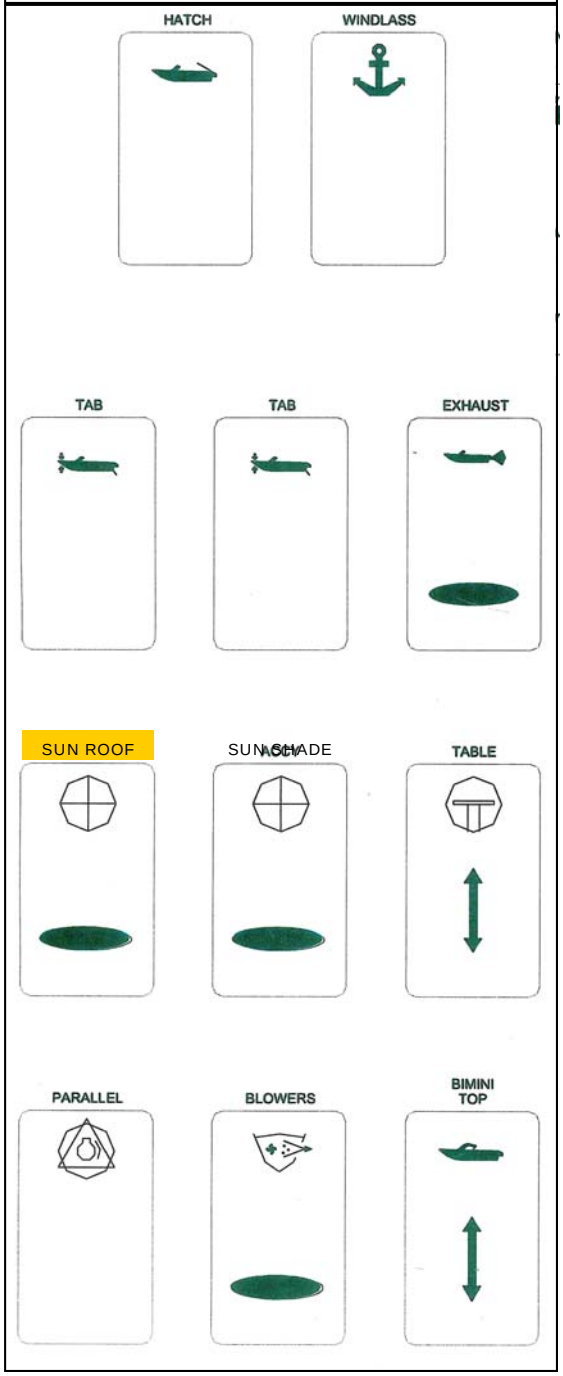
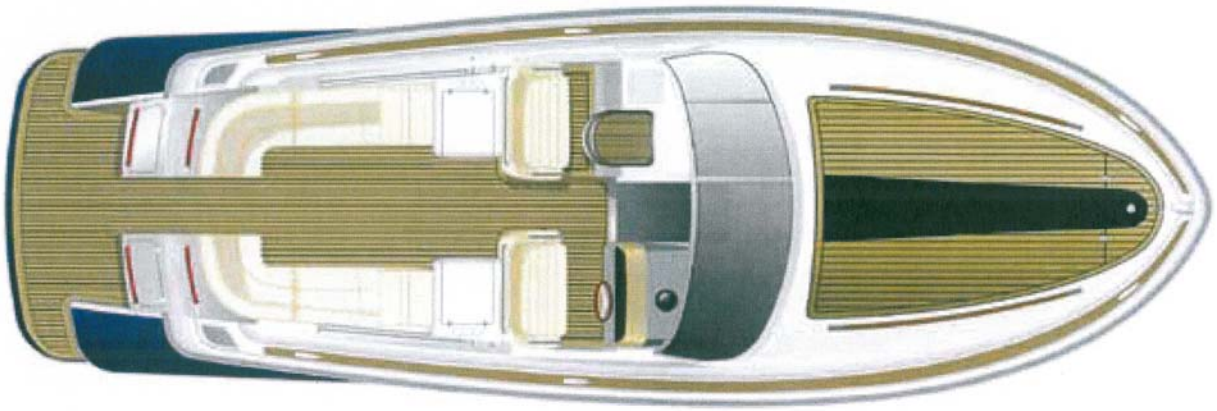
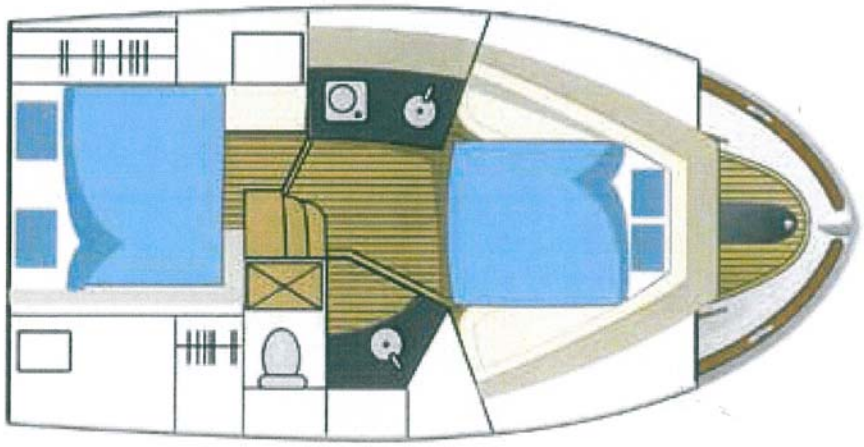


Figure 3-98.

Enjoy Your New

Chris★Craft®





CHAPTER 4

Storage and Commissioning

In climates where freezing occurs, it is important to prepare the boat for storage. This procedure is called winterizing.

Winterizing is the procedure of removing all water from the boat that might otherwise freeze and damage plumbing and components. In those areas where water cannot be removed, anti-freeze is added to prevent freezing and damage.

The procedures in this chapter are general in nature and not all inclusive. Additionally you must consult individual component manuals for instructions on how to winterize any of the specific components.

Winter Storage

When you prepare your boat for winter storage, you should also prepare the trailer.

General

_____ Completely wash and wax the boat, both inside and out. Remove all marine growth and scum.
_____ Inspect all sections of the boat for damage and paint wear.
_____ Inspect all underwater gear, including propellers for wear and damage.
_____ Remove cushions and other fabric-type items and store in a clean, dry area. For those items that cannot be removed leave a chemical dehumidifier or mildew inhibitor under the cover.
_____ Clean and store all PFDs in a clean, dry environment.
_____ Clean all cupboards, cabinets, and drawers with mild soap and water. Dry completely. Remove any item that may cause mildew.
_____ Lubricate all hatch and locker hinges. Leave open if possible.
_____ Remove all electronics and store in a dry, secure area.
_____ Store the boat in a bow high attitude.
_____ Drain and dry all sections of the bilge. Remove all drain plugs and store in a plastic bag. Secure plugs to the throttle level.
_____ Position the cover to prevent the pooling of water.
_____ Ventilate to prevent mildew and allow air flow.
_____ Slacken tie downs to reduce strain on the hull.
_____ Inspect the boat regularly during storage.

Fresh Water Systems

_____Turn on the pressure water pump, open all faucets and drain the system completely. Leave all faucets open. Ensure the storage tank is completely empty. It is not recommended that you leave water in the fresh water system. If you choose to leave water in the fresh water system during winter storage you must add non-toxic antifreeze. Winterize in accordance with the following steps.
_____ Fill the water tank with a solution of fresh water and non-toxic antifreeze.
_____ Open the faucet furthest away from the water pump. Energize the water pump and run until antifreeze solution flows from the faucet.
_____ Open other faucets and run until antifreeze solution appears. Close all faucets.
_____ Disengage water pump breaker.

Engines and Fuel Tank

_____ Refer to the engine owner's manual for detailed winterization instructions.
_____ Gasoline Engines – Fill tank and add a gas stabilizer and conditioner.
_____ Diesel Engines – Fill tank and add biocide and/or petroleum distillate additive.

Batteries

_____ Remove the batteries from the boat and clean both batteries and battery terminals.
_____ Properly store batteries in a cool, dry place. Do not store on concrete.
_____ Place on a regulated trickle charge.

Marine Sanitation Device

_____ Prepare in accordance with manufacturer's directions.

Spring Commissioning

General

_____ Clean all sections of the boat as necessary.
_____ Inspect all thru-hull openings. Ensure they are clean and open.
_____ Check running gear. Replace propellers if removed.
_____ Check all life saving gear. Replace as necessary.
_____ Cycle all seacocks and valves to ensure proper and free movement. Leave open appropriate valves. Check hoses and clamps. Re-install all drain plugs.
_____ Inspect the electrical system completely.
_____ Inspect navigation lights and check for proper operation.
_____ Check all switches for proper operation.
_____ Ensure engine compartment blower is operating properly. Make sure exhaust vents are not obstructed.
_____ Inspect, and if necessary replace, anchor lines and gear.

Fuel System

_____ Thoroughly check each fitting and hose in the fuel system. Ensure it is fuel and vapor tight.
_____ Open any valves closed for winterization.

Engines

_____ Refer to the engine owner's manual for detailed recommissioning instructions.
_____ Ensure fluids are at proper levels.

Batteries

_____ Ensure batteries are clean and corrosion-free before installing.
_____ Ensure batteries are properly secured in their mounts.

Fresh Water Systems

_____ Connect any water lines that may have been removed or disconnected.
_____ Energize pressure pump and check for leaks.
_____ Sanitize the system. Flush the system completely. If necessary drain and re-flush. Ensure all contaminants are removed from the system.
_____ Bleed all air from the system.
_____ Close all faucets as required.

Bilge Pumps

_____ Check bilge pump operation in both automatic and manual mode.

Warning: Do not drain anti freeze from the closed cooling system drain plugs.

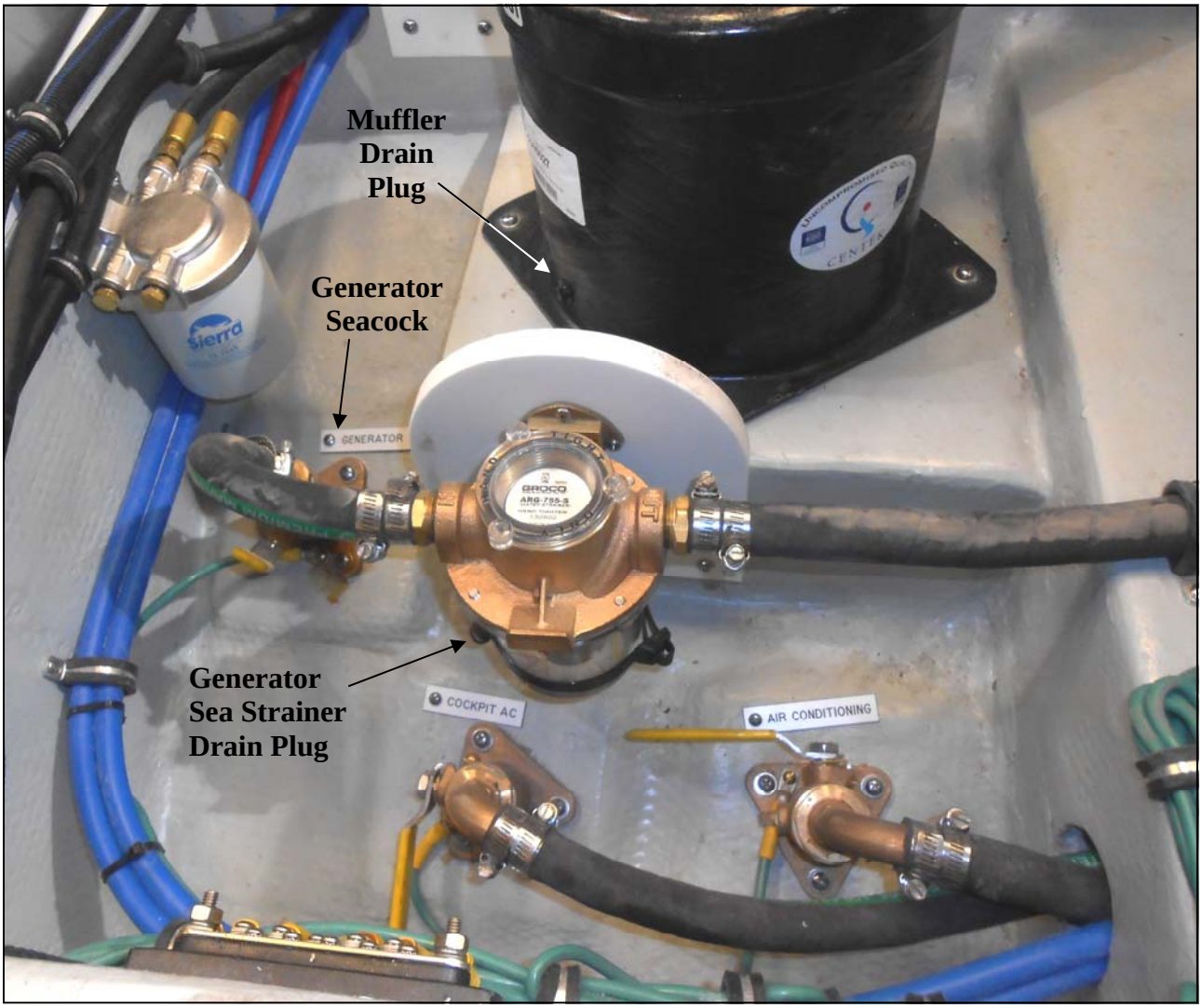


Figure 4-1

1. Drain all raw water from the seawater cooling system.
2. Water left in the engines will freeze cause damage.
3. Open the generator seacock and drain water completely.
4. Close the seacock after the draining and remove the pickup hose from the seacock.
5. Place the removed hose end into a two gallon container of anti-freeze and disconnect the lead (#87) to the low seawater pressure switch (LWP).
6. Run the generator until the coolant discharges at the exhaust outlet or until depleting the coolant mixture. Replace lead #87.
7. Remove the drain plug in the generator sea strainer and completely drain the water.
8. Place the plug in the important papers bag.
9. Remove the drain plug in Centec muffler and drain the cooling seawater.
10. Place the plug in the important papers bag.
11. Add Stabil to the auxiliary fuel tank before running the generator.
12. This will allow the fuel to remain in the two fuel pumps without having to drain them after the winterization process is completed.
13. Clean the exterior of the generator and spray with a light film of oil over all of the exposed surfaces.

Figure 4-2

Figure 4-3

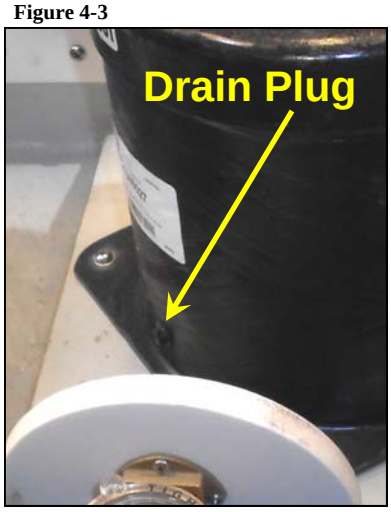


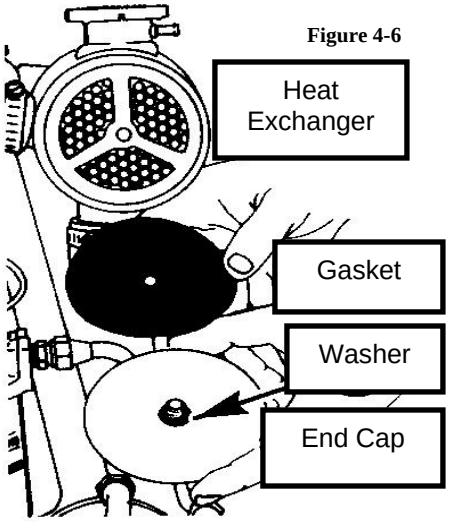
Figure 4-4

Figure 4-5

Mercruiser Air Actuated Single Point Drain System

1. This procedure refers to the air pump attached to the front of the engine. Any air source can be used.
2. Water left in the engines will freeze and cause damage.
3. Ensure that the lever on top of the pump is flush with the handle (horizontal).
4. Install the air pump on the fitting in the air manifold.
5. Pull the lever up (vertical) to lock the pump onto the fitting.
6. Pump air into the system until both green indicators extend and water drains from each opening in the engine.
7. ***Immediately*** remove the blue drain plug from the side of the heat exchanger.
8. ***This must be removed within 30 seconds.***
9. Allow the system to drain for a minimum of five **(5)** minutes.
10. Add air as necessary to keep the green indicators extended.
11. Crank the engine over with the starter motor to purge any water trapped in the seawater pump.
12. Do not allow the engine to start.
13. Reinstall the blue plug in the heat exchanger.
14. Remove the air pump from the air manifold and place in bracket.
15. If air activated System fails use all blue plugs to drain the engine.
16. Remove end caps, washer and gasket from the heat exchanger.
17. To ensure that all water is drained leave the drain system open while transporting.

Figure 4-6



Remove the end caps to manually drain the system

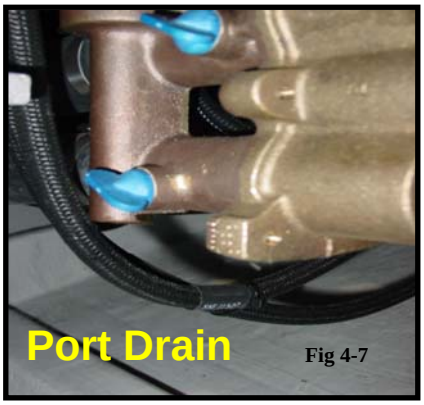


Fig 4-7

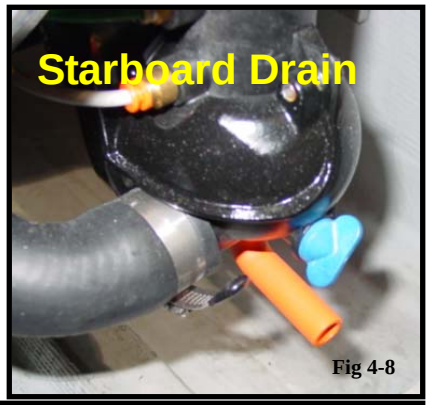
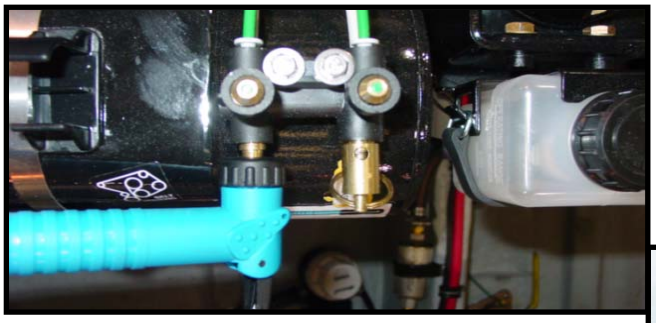


Fig 4-8



Warning: Do not drain anti freeze from the closed cooling system drain plugs.

Fig 4-9

Mercruiser Manual Three Point Drain System

1. Use this procedure if the engine is not equipped with an air activated single point drain system.
2. Start by removing the blue plug in the thermostat housing to allow the system to drain down from that point.
3. Remove a blue plug from the distribution housing located on the lower port side of the engine.
4. Remove two (2) blue plugs from the raw water pump located on the lower starboard side of the engine.
5. Verify that water is draining from each opening. Allow the system to drain for a minimum of five (5) minutes.
6. Place plugs in the important papers pouch.
7. Crank the engine over with the starter motor to purge any water trapped in the seawater pump.
8. Do not allow the engine to start.

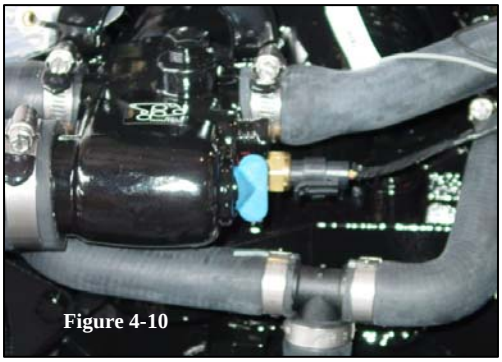


Figure 4-10

Raw Water Pump

The **Thermostat Housing** is located in front of the engine at the top.

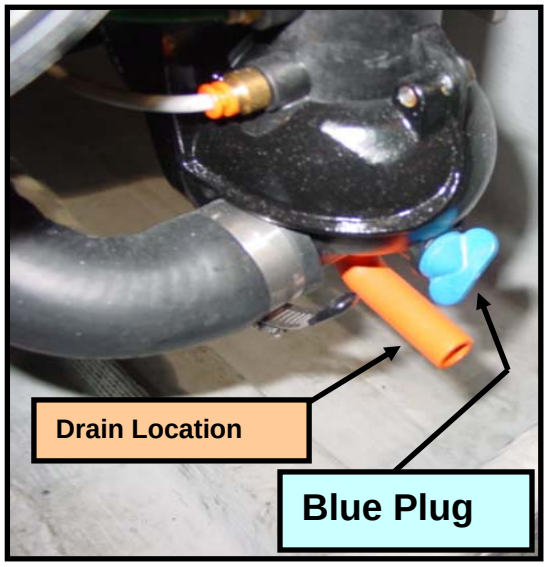


Figure 4-11

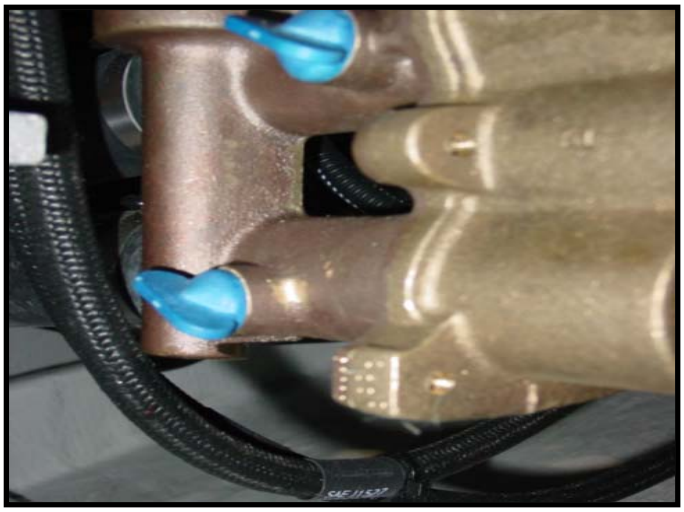


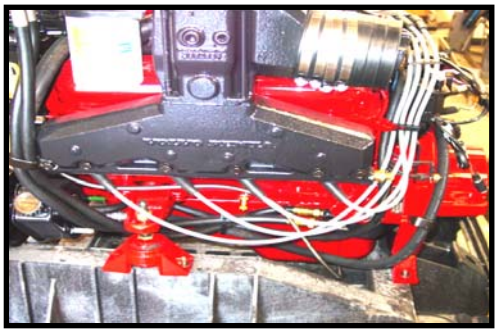
Figure 4-12

Distribution Housing

Warning: Do not drain anti freeze from the closed cooling system drain plugs.

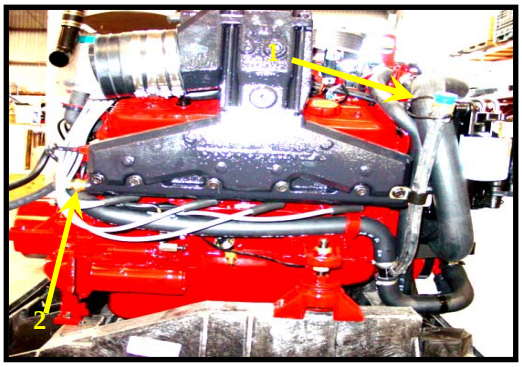
Volvo EVC Catalytic with Joy Stick

1. Locate and remove the engine drain plug of the port side of the engine block.
   * NOTE* plug is located 2/3 aft and 1/3 up on engine block.
2. Locate and remove the port exhaust manifold drain plug on the forward side of the engine manifold.
3. Locate and remove the engine **drain plug** on **starboard** side of the engine block.
   NOTE plug is located 2/3 aft and 1/3 up on engine block.
4. Locate and remove **starboard** exhaust manifold **drain plug** on the aft side of the engine manifold.
5. Locate and remove the water pump hoses at the front of the engine and allow water to drain completely out.
6. Place four (**4**) drain fittings, two (**2**) hose clamp, garboard drain.
7. For closed cooled engines (FWC) loosen the lower end cap from the heat exchanger until all water drains and then replace cap.
8. Failure to connect the raw water pump hoses in the correct orientation will damage the raw water pump impeller.
9. Ensure that the engine side of the system has adequate anti-freeze to protect it from damage.
10. Be sure that all water is drained from the engine. If no water drains from the engine with the drains open use a piece of wire to clear any debris from the drain hole.
11. Failure to do so may damage the engine.



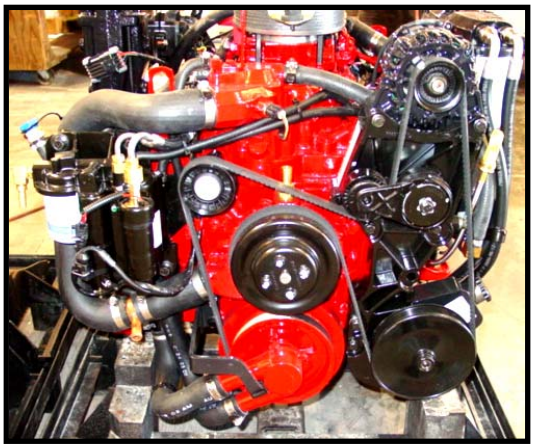
Engine Port Side View

Figure 4-13



Engine Starboard Side View

Figure 4-14



Engine Front View

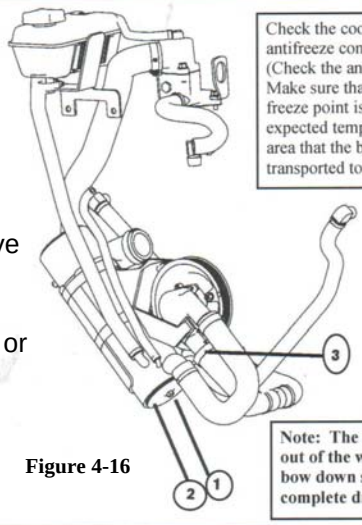
Figure 4-15

Warning: Do not drain anti freeze from the closed cooling system drain plugs.

Closed Cooling Drain And Winterization Check List

1. With the engine turned off locate and loosen the lower end cap of the heat exchanger. See photo for location of the exchanger.
2. After the water has completely drained retighten the lower end cap of the heat exchanger. It is not necessary to remove the end cap.
3. Remove the drain plugs from the exhaust manifolds. Raise or lower the bow to ensure complete drainage.
4. After all of the water is completely drained, place the drain plugs in a plastic bag and attach to the engines.
5. Note the hose orientation of the raw water pump. Loosen the hose clamps and remove the hoses from the raw water pump.
6. Crank the engine briefly, one or two crankshaft revolutions but do not start the engine to clear water from the pump.
7. Reinstall the hoses and secure the clamps in the same orientation as they were when removed.
8. Failure to connect the raw water pump hoses in the correct orientation will damage the water pump impeller.
9. Be sure that all water is drained from the engine. Failure to drain all water will result in freeze damage to the engines.

Volvo 5.7 Series Fresh Water Cooled Engines



Check the coolant level and antifreeze concentration. (Check the antifreeze specs). Make sure that the antifreeze's freeze point is adequate for the expected temperatures for the area that the boat is being transported to. △

Note: The boat should be out of the water with the bow down slightly to allow complete drainage. △

Figure 4-16

1. Using a 9/16 inch wrench, loosen but do not remove the cover bolt (1) on the bottom of the heat exchanger approximately three revolutions.
2. Twist the heat exchanger cover and gasket (2) in either direction and allow the water to completely drain from the system.
3. After the heat exchanger is drained, retighten the cover bolt to 20 ft. lb.
4. Loosen the hose clamp (3) on the raw water inlet hose and remove the hose from the raw water pump.
5. Allow all water to drain and reinstall the hose and tighten the hose clamp.

Figure 4-17

The Fresh Water Cooled Engine is Shown here. The heat exchanger is located as shown on the Starboard side of the engine.

Warning: Do not drain anti freeze from the closed cooling system drain plugs.

Closed Cooling Drain And Winterization

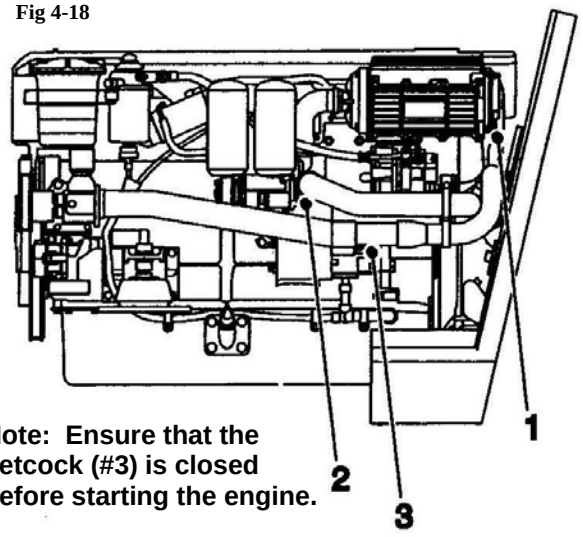
Draining the seawater system

Use a suitable receptacle while draining.

Open the drain nipple (1) by carefully screwing the nipple. Use a no. 17 block spanner if the nipple sticks. Drain all coolant and screw in the nipple by hand.

Move the hose and then continue to drain the coolant from the drain nipple (2) and (3).

Fig 4-18



Note: Ensure that the petcock (#3) is closed before starting the engine.

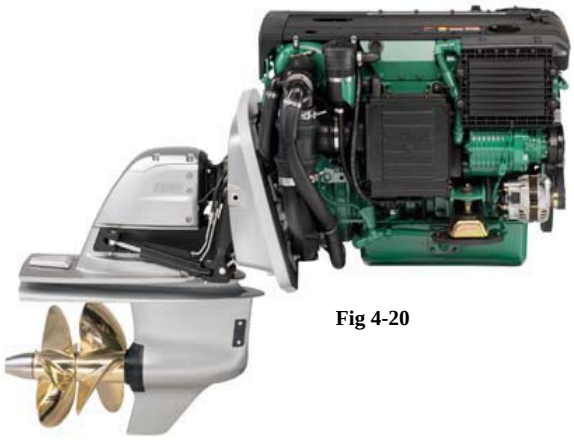


Fig 4-20

Warning: Do not drain anti freeze from the closed cooling system drain plugs.

Cleaning seawater filter.

WARNING! Risk for water penetration.

Screw off cover (1) and remove seal plate (2). Lift out and clean the insert (3).

IMPORTANT! If the boat is used in water that has a lot of contaminants, seaweed etc. the filter must be checked more frequently than indicated in the maintenance schedule. Otherwise there is a risk the filter will clog and the engine will overheat.

Fig 4-19

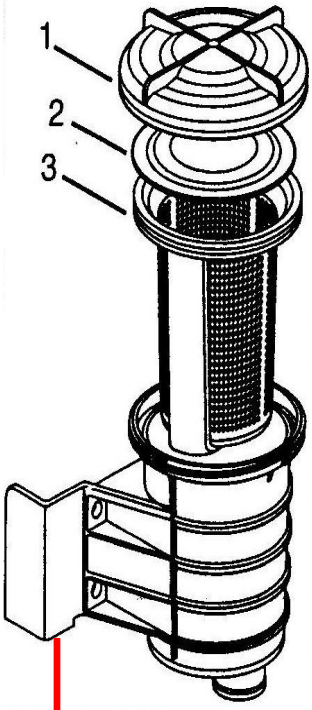


Fig 4-21

How To Clean Clear Vinyl Eisenglass Boat Windows

Clear Vinyl Roll and Sheet windows

Routine Cleaning:

-Rinse off loose dirt and particles with clean fresh water.
-Fill a clean bucket with fresh water and add a mild, non-detergent soap such as ***EisenClean.*** Check the soap instructions for the proper amount. Although EisenClean is designed for cool water use most marina's don't provide hot water it will clean with warm water just as well.
-Wash the windows by wiping them with a soft cloth, towel or washing mitt and soap/water solution.
-Rinse thoroughly in the same manner with clean fresh water and a clean cloth.
-Dry the eisenglass with a clean absorbent cloth or towel to prevent water spots.
-Now the windows are ready for a UV protectant and/or polish.

DO NOT:
-Do not use window cleaner Windex, detergent soap, dish soap, fantastic, simple green or any other cleanser on clear vinyl boat windows. These chemicals break down the plasticizers and UV inhibitors that prevent yellowing, hazing and cracking.
-Do not use paper towel or anything abrasive to wipe the windows because they will scratch.

DO:
-Only use a mild non detergent soap such as EisenClean and/or products that are specifically labeled for use on clear vinyl boat windows or eisenglass.
-Frequently apply a specialized polish and/or UV protectant after cleaning to maintain clarity and prevent sun damage such as 303 Aerospace Protectant or Plexus.

Appendix A Warranty Information

CHRIS-CRAFT CUSTOMER PROBLEM RESOLUTION

If a customer experiences a problem with a Chris-Craft Product:

They should maintain written record of events (the problem, related conversations/with whom, important

dates, etc.), as well as any supporting documents (invoices, work orders, etc.), and take the following steps:

1. Discuss the matter with the appropriate department manager at the dealership (e.g. Service Manager, Parts Manager, etc.). Explain exactly what the problem/cause is and ask what action will be taken to resolve it. The Department Manager may find it necessary to contact Chris-Craft on behalf of the customer in order to find a resolution.

If the matter remains unresolved after a reasonable amount of time:

2. Discuss the matter with the Dealer Principal (usually the owner or co-owner of the dealership). Explain what has occurred including the problem and the subsequent discussion with the Department Manager.

If the matter remains unresolved:

3. Contact the Chris-Craft Customer Service Department at::

Chris-Craft Corporation
Customer Service Department
8161 15th Street East
Sarasota, FL 34243
(941) 351-4900

POWERTRAIN WARRANTY

Any matter involving the power train is the responsibility of the power train manufacturer or its authorized representative. The power train warranty consists of that offered by the manufacturer of the product, or its authorized representative in the specific county, and should be addressed by them.

Power train Manufacturers used by Chris-Craft for this boat is:

Mercruiser
3003 North Perkins Road
Stillwater, OK 74075
Telephone: (405) 743-6555
www.mercurymarine.com

Volvo Penta of the Americas, Inc.
1300Volvo Penta Drive
Chesapeake, VA 23320
Telephone: (757) 436-2600
www.volvopenta.com

APPENDIX B

Coast Guard Accident Report

This appendix contains a copy of the Coast Guard Accident Report currently in use. If you are involved in an accident, ensure you verify that you are using the latest form available.

OMB Control No. 1625-0001

U.S. DEPARTMENT OF HOMELAND SECURITY U.S. COAST GUARD CG-2692 (Rev. 06-04)	**REPORT OF MARINE ACCIDENT, INJURY OR DEATH**	RCS No. G-MOA MISLE NOTIFICATION NUMBER

SECTION I. GENERAL INFORMATION

1. Name of Vessel or Facility	2. Official No.	3. Nationality	4. Call Sign	5. USCG Certificate of Inspection issued at:

6. Type *(Towing, Freight, Fish, Drill, etc.)*	7. Length	8. Gross Tons	9. Year Built	10. Propulsion *(Steam, diesel, gas, turbine...)*

11. Hull Material *(Steel, Wood...)*	12. Draft *(Ft. - in.)* FWD	AFT.	13. If Vessel Classed, By Whom: *(ABS, LLOYDS, DNV, BV, etc.)*	14. Date *(of occurrence)*	15. TIME *(Local)*

16. Location *(See Instruction No. 10A)*	17. Estimated Loss of Damage TO:
18. Name, Address & Telephone No. of Operating Co.	VESSEL _____ CARGO _____ OTHER _____

19. Name of Master or Person in Charge	USCG License ☐ YES ☐ NO	20. Name of Pilot	USCG License ☐ YES ☐ NO	State License ☐ YES ☐ NO

19a. Street Address *(City, State, Zip Code)*	19b. Telephone Number	20a. Street Address *(City, State, Zip Code)*	20b. Telephone Number

21. Casualty Elements *(Check as many as needed and explain in Block 44.)*

- NO. OF PERSONS ON BOARD _____
- ☐ DEATH - HOW MANY? _____
- ☐ MISSING - HOW MANY? _____
- ☐ INJURED - HOW MANY? _____
- ☐ HAZARDOUS MATERIAL RELEASED OR INVOLVED *(Identify Substance and amount in Block 44.)*
- ☐ OIL SPILL - ESTIMATE AMOUNT: _____
- ☐ CARGO CONTAINER LOST/DAMAGED
- ☐ COLLISION *(Identify other vessel or object in Block 44.)*
- ☐ GROUNDING ☐ WAKE DAMAGE
- ☐ FLOODING; SWAMPING WITHOUT SINKING
- ☐ CAPSIZING *(with or without sinking)*
- ☐ FOUNDERING OR SINKING
- ☐ HEAVY WEATHER DAMAGE
- ☐ FIRE
- ☐ EXPLOSION
- ☐ COMMERCIAL DIVING CASUALTY
- ☐ ICE DAMAGE
- ☐ DAMAGE TO AIDS TO NAVIGATION
- ☐ STEERING FAILURE
- ☐ MACHINERY OR EQUIPMENT FAILURE
- ☐ ELECTRICAL FAILURE
- ☐ STRUCTURAL FAILURE
- ☐ FIREFIGHTING OR EMERGENCY EQUIPMENT FAILED OR INADEQUATE *(Describe in Block 44.)*
- ☐ LIFESAVING EQUIPMENT FAILED OR INADEQUATE *(Describe in Block 44.)*
- ☐ BLOW OUT *(Petroleum exporation/production)*
- ☐ ALCOHOL INVOLVEMENT *(Describe in Block 44.)*
- ☐ DRUG INVOLVEMENT *(Describe in Block 44.)*
- ☐ OTHER *(Specify)* _____

22. Conditions

A. Sea or River Conditions *(wave height, river stage, etc.)*

B. WEATHER
- ☐ CLEAR
- ☐ RAIN
- ☐ SNOW
- ☐ FOG
- ☐ OTHER *(Specify)* _____

C. TIME
- ☐ DAYLIGHT
- ☐ TWILIGHT
- ☐ NIGHT

D. VISIBILITY
- ☐ GOOD
- ☐ FAIR
- ☐ POOR

E. DISTANCE *(miles of visibility)* _____

F. AIR TEMPERATURE (F) _____

G. WIND SPEED & DIRECTION _____ _____

H. CURRENT SPEED & DIRECTION _____ _____

23. Navigation Information		24. Last Port Where Bound	24a. Time and Date of Departure
☐ MOORED, DOCKED OR FIXED ☐ ANCHORED ☐ UNDERWAY OR DRIFTING	SPEED AND COURSE _____	_____	

25. FOR TOWING ONLY	25a. NUMBER OF VESSELS TOWED	Empty	Loaded	Total	25b. TOTAL H.P. OF TOWING UNITS	25c. MAXIMUM SIZE OF TOW WITH TOW-BOAT(S)	Length	Width	25d. *(Describe in Block 44.)*
									☐ PUSHING AHEAD ☐ TOWING ASTERN ☐ TOWING ALONGSIDE ☐ MORE THAN ONE TOW-BOAT ON TOW

SECTION II. BARGE INFORMATION

26. Name	26a. Official Number	26b. Type	26c. Length	26d. Gross Tons	26e. USCG Certificate of Inspection Issued at:

26f. Year Built	26g. ☐ SINGLE SKIN ☐ DOUBLE	26h. Draft FWD	AFT	26i. Operating Company

26j. Damage Amount	26k. Describe Damage to Barge
BARGE _____ CARGO _____ OTHER _____	

PREVIOUS EDITION IS OBSOLETE

PAGE 2 OF CG-2692 (REV. 06-04)

SECTION III. PERSONNEL ACCIDENT INFORMATION

27. Person Involved	27a. Name *(Last, First, Middle Name)*	27c. Status
☐ MALE or ☐ FEMALE ☐ DEAD ☐ INJURED ☐ MISSING	27b. Address *(City, State, Zip Code)*	☐ Crew ☐ Passenger ☐ Other

28. Birth Date	29. Telephone No.	30. Job Position	31. *(Check here if off duty)* ☐

32. Employer - *(if different from Block 18., fill in Name, Address, Telephone No.)*

33. Person's Time	YEAR(S)	MONTH(S)
A. IN THIS INDUSTRY -		
B. WITH THIS COMPANY -		
C. IN PRESENT JOB OR POSITION -		
D. ON PRESENT VESSEL/FACILITY -		
E. HOURS ON DUTY WHEN ACCIDENT OCCURRED -		

34. Industry of Employer *(Towing, Fishing, Shipping, Crew Supply, Drilling, etc.)*

35. Was the Injured Person Incapacitated 72 Hours or More?

36. Date of Death

37. Activity of Person at Time of Accident

38. Specific Location of Accident on Vessel/Facility

39. Type of Accident *(Fall, Caught between, etc.)*	40. Resulting Injury *(Cut, Bruise, Fracture, Burn, etc.)*
41. Part of Body Injured	42. Equipment Involved in Accident

43. Specific Object, Part of the Equipment in block 42., or Substance *(Chemical, Solvent, etc.)* that directly produced the Injury.

SECTION IV. DESCRIPTION OF CASUALTY

44. Describe how accident occured, damage, information on alcohol/drug involvement and recommendations for corrective safety measures. *(See instructions and attach additional sheets if necessary).*

45. Witness *(Name, Address, Telephone No.)*

46. Witness *(Name, Address, Telephone No.)*

SECTION V. PERSON MAKING THIS REPORT

47. Name (PRINT) *(Last, First, Middle)*	47b. Address *(City, State, Zip Code)*	47c. Title
		47d. Telephone No.
47a. Signature		47e. Date

FOR COAST GUARD USE ONLY	REPORTING OFFICE:

MISLE Incident Investigation Activity Data Entry: MISLE Incident Investigation Activity Number (if applicable)

☐ NONE ☐ PRELIMINARY ☐ DATA COLLECTION ☐ INFORMAL ☐ FORMAL

Serious Marine Incident ☐ Yes ☐ No Major Marine Casualty ☐ Yes ☐ No	INVESTIGATOR *(Name)*	DATE	APPROVED BY *(Name)*	DATE

INSTRUCTIONS

FOR COMPLETION OF FORM CG-2692

REPORT OF MARINE ACCIDENT, INJURY OR DEATH

AND FORM CG-2692A, BARGE ADDENDUM

WHEN TO USE THIS FORM

1. This form satisfies the requirements for written reports of accidents found in the Code of Federal Regulations for vessels, Outer Continental Shelf (OCS) facilities, mobile offshore drilling units (MODUs), and diving. The kinds of accidents that must be reported are described in the following instructions.

VESSELS

2. A vessel accident must be reported if it occurs upon the navigable waters of the U.S., its territories or possessions; or whenever an accident involves a U.S. vessel; wherever the accident may occur. (Public vessels and recreational vessels are excepted from these reporting requirements.) The accident must also involve one of the following (ref. 46 CFR 4.05-1):

A. All accidental groundings and any intentional grounding which also meets any of the other reporting criteria or creates a hazard to navigation, the environment, or the safety of the vessel;

B. Loss of main propulsion or primary steering, or an associated component or control system, the loss of which causes a reduction of the maneuvering capabilities of the vessel. Loss means that systems, component parts, subsystems, or control systems do not perform the specified or required function;

C. An occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route including but not limited to fire, flooding, failure or damage to fixed fire extinguishing systems, lifesaving equipment or bilge pumping systems;

D. Loss of life;

E. An injury that requires professional medical treatment (beyond first aid) and, if a crewmember on a commercial vessel, that renders the individual unfit to perform routine duties.

F. An occurrence not meeting any of the above criteria but resulting in damage to property in excess of $25,000. Damage cost includes the cost of labor and material to restore the property to the condition which existed prior to the casualty, but it does not include the cost of salvage, cleaning, gas freeing, drydocking or demurrage.

MOBILE OFFSHORE DRILLING UNITS

3. MODUs are vessels and are required to report an accident that results in any of the events listed by Instruction 2-A through 2-F for vessels. (Ref. 46 CFR 4.05-1, 46 CFR 109.411)

OCS FACILITIES

4. All OCS facilities (except mobile offshore drilling units) engaged in mineral exploration, development or production activities on the Outer Continental Shelf of the U.S. are required by 33 CFR 146.30 to report accidents resulting in:

A. Death;

B. Injury to 5 or more persons in a single incident;

C. Injury causing any person to be incapacitated for more than 72 hours;

D. Damage affecting the usefullness of primary lifesaving or firefighting equipment;

E. Damage to the facility in excess of $25,000 resulting from a collision by a vessel;

F. Damage to a floating OCS facility in excess of $25,000.

5. Foreign vessels engaged in mineral exploration, development or production on the U. S. Outer Continental Shelf, other than vessels already required to report by Instructions 2 and 3 above, are required by 33 CFR 146.303 to report casualties that result in any of the following:

A. Death;

B. Injury to 5 or more persons in a single incident;

C. Injury causing any person to be incapacitated for more than 72 hours.

DIVING

6. Diving casualties include injury or death that occurs while using underwater breathing apparatus while diving from a vessel or OCS facility.

A. COMMERCIAL DIVING. A dive is considered commercial if it is for commercial purposes from a vessel required to have a Coast Guard certificate of inspection, from an OCS facility or in its related safety zone or in a related activity, at a deepwater port or in its safety zone. Casualties that occur during commercial dives are covered by 46 CFR 197.486 if they result in:

1. Loss of life;
2. Injury causing incapacitation over 72 hours;
3. Injury requiring hospitalization over 24 hours.

In addition to the information requested on this form, also provide the name of the diving supervisor and, if applicable, a detailed report on gas embolism or decompression sickness as required by 46 CFR 197.410(a)(9).

Exempt from the commercial category are dives for:

1. Marine science research by educational institutions;
2. Research in diving equipment and technology;
3. Search and Rescue controlled by a government agency.

B. ALL OTHER DIVING. Diving accidents not covered by Instruction (6-A) but involving vessels subject to Instruction (2), VESSELS, must be reported if they result in death or injury causing incapacitation over 72 hours. (Ref. 46 CFR 4.03-1(c)).

HAZARDOUS MATERIALS

7. When an accident involves hazardous materials, public and environmental health and safety require immediate action. As soon as any person in charge of a vessel or facility has knowledge of a release or discharge of oil or a hazardous substance, that person is required to immediately notify the U. S. Department of Homeland Security's National Response Center (telephone toll-free 800-424-8802 - in the Washington, D.C. area call 202-426-2675). Anyone else knowing of a pollution incident is encouraged to use the toll-free telephone number to report it. If etiologic (disease causing) agents are involved, call the U.S. Public Health Service's Center for Disease Control in Atlanta, GA. (telephone 404-633-5313). (Ref. 42 USC 9603; 33 CFR 153; 49 CFR 171.15)

COMPLETION OF THIS FORM

8. This form should be filled out as completely and accurately as possible. Please type or print clearly. Fill in all blanks that apply to the kind of accident that has occurred. If a question is not applicable, the abbreviation "NA" should be entered in that space. If an answer is unknown and cannot be obtained, the abbreviation "UNK" should be entered in that space. If "NONE" is the correct response, then enter it in that space.

9. Once completed, deliver or mail this form as soon as possible to the Coast Guard Marine Safety, Marine Inspection or Activities Office nearest the location of the casualty or, if at sea, nearest the arrival port.

10. Amplifying information for completing the form:

A. Block 16 - "LOCATION" - Latitude and longitude to the nearest tenth of a minute should always be entered except in those rivers and waterways where a mile marker system is commonly used. In these cases, the mile number to the nearest tenth of a mile should be entered. If the latitude and longitude, or mile number, are unknown, reference to a known landmark or object (buoy, light, etc.) with distance and bearing to the object is permissible. Always identify the body of water or waterway referred to.

B. Tug or towboat with tow - Tugs or towboats with tows under their control should complete all applicable portions of the CG-2692. SECTION II should be completed if a barge causes or sustains damage or meets any other reporting criteria. If additional barges require reporting, the "Barge Addendum," CG-2692A, may be used to provide the information for the additional barges.

C. Moored/Anchored Barge - If a barge suffers a casualty while moored or anchored, or breaks away from its moorage, and causes or sustains reportable damages or meets any other reporting criteria, enter the location of its moorage in Block (1) of the CG-2692 and complete the form except for Blocks (2) through (13). The details will be entered in SECTION II for one barge and on the "Barge Addendum" CG-2692A, for additional barges.

D. SECTION III - Personnel Accident Information - SECTION III must be completed for a death or injury. In addition, applicable portions of SECTIONS I, II and IV must be completed. If more than one death or injury occurs in a single incident, complete one CG-2692 for one of the persons injured or killed, and attach additional CG-2692's, filling out Blocks (1) and (2) and SECTION III for each additional person.

E. BLOCK 44 - Describe the sequence of events which led up to this casualty. Include your opinion of the primary cause and any contributing causes of the casualty. Briefly describe damage to your vessel, its cargo, and other vessels/property. Include any recommendations you may have for preventing similar casualties. *ALCOHOL AND DRUG INFORMATION.* Provide the following information with regard to each person determined to be directly involved in the casualty: name, position aboard the vessel, whether or not the person was under the influence of alcohol or drugs at the time of the casualty, and the method used to make this determination. If toxicological testing is conducted the results should be included; if results are not available in a timely manner, provide the results of the toxicological test as soon as practical and indicate that this is the case in block 44 of the casualty form.

NOTICE: The information collected on this form is routinely available for public inspection. It is needed by the Coast Guard to carry out its responsibility to investigate marine casualties, to identify hazardous conditions or situations and to conduct statistical analysis. The information is used to determine whether new or revised safety initiatives are necessary for the protection of life or property in the marine environment.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number.

The Coast Guard estimates that the average burden for this report is 1 hour. You may submit any comments concerning the accuracy of this burden estimate or any suggestions for reducing the burden to: Commandant (G-MOA), U.S. Coast Guard, Washington, DC 20593-0001 or Office of Management and Budget, Paperwork Reduction Project (1625-0001), Washington, DC 20503

APPENDIX C

Float Plan

Float plans detail your intentions. It describes your course, itinerary, vessel description, expected date of arrival at your destination, and your expected return time. Leave the plan with a friend or relative, who in turn can notify the Coast Guard in the event you fail to return.
This appendix contains an example of a float plan, currently in use, that you can copy and utilize.

The Coast Guard does not provide float plan services but encourages you to leave a sailing plan with friends or relatives to whom you can report your safe arrival. Should your friends or relative fail to receive information on your arrival when due or within a reasonable time thereafter, they should notify the nearest Coast Guard activity.

A FLOAT PLAN should include the following information at a minimum (a **FLOAT PLAN** is supplied in the back of this section, section B page 12).

- The VESSEL NAME including registration numbers.
- A VESSEL DISCRIPTION, (type, color, length…)
- POINT of DEPARTURE (harbor/marina).
- ROUTE to be taken.
- DESTINATION.
- ESTIMATED TIME of ARRIVAL (ETA).
- NUMBER OF PERSONS ABOARD.
- SAFETY EQUIPMENT ABOARD.
- COMMUNICATIONS EQUIPMENT, including radio frequencies to be monitored and a cellular number.

If any major part of your float plan changes, for example you change routes or stop along the way, you should contact your representatives ashore and update the float plan.

Float Plan

Complete this form before going boating and leave it with a reliable person who can be depended upon to notify the Coast Guard or other rescue organization, should you not return as scheduled.

Do not file this plan with the Coast Guard. Remember to contact your friend in case of delay and when you return.

1. Person Reporting Overdue

Name_____Phone_____

Address_____

2. Description of Boat

Name_____

Registration/Documentation No. _____ Length_____

Make_____ Type ____

Hull Color_____ Trim Color_____

Fuel Capacity____ Engine Type____No. of Engines__

Distinguishing Features_____

_____

3. Operator of Boat

Name_____

Age _____

Health _____ Phone _____

Address_____

_____

Operator's Experience _____

_____

4. Survival Equipment (Check as Appropriate)

❑ #___PFDs	❑ Flares	❑ Mirror
❑ Smoke Signals	❑ Flashlight	❑ Food
❑ Paddles	❑ Water	❑ Anchor
❑ Raft or Dinghy	❑ EPIRB	

5. Marine Radio: ❑ Yes ❑ No

Type _____ Freqs. _____

Digital Selective Calling (DSC) ❑ Yes ❑ No

6. Trip Expectations

Depart from _____

Departure Date _____ Time _____

Going to_____

Arrival Date _____ Time _____

If operator has not arrived/returned by:
Date_____Time _____
call the Coast Guard or Local authority at the following number:

_____

_____

7. Vehicle Description

License No. _____ Make _____

Model_____ Color _____

Where is vehicle parked? _____

_____

8. Persons on Board

Name Age Phone Medical Conditions

_____

_____

_____

_____

_____

_____

_____

9. Additional Information

_____

_____

_____

_____

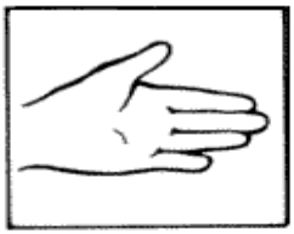
APPENDIX D

Water Skiing

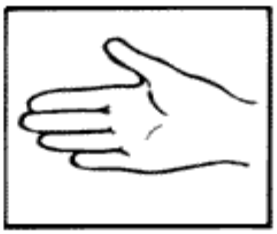
Water skiing has brought a special set of safety precautions to observe while boating.

1. Water ski only in safe and/or designated areas. Stay away from areas designated for swimmers and skin divers.
2. NEVER ski while under the influence of alcohol or drugs.
3. Ski only in water free of underwater obstructions. Avoid shallow waters, other boats, navigational aids, and other obstructions.
4. Ski only during daylight when visibility is good. Never ski after dark. Not only is it dangerous, but it is illegal.
5. Do not ski with 300 feet of another vessel, 100 feet of the shore, or dock.
6. Do not ski in rough waters.
7. Do not ski when it is raining.
8. If skiing in cooler weather understand the effects of hypothermia and take the proper precautions.
9. All skiers must wear a USCG approved personal flotation device (PFD).
10. Ensure everyone understands the hand signals.
11. A competent observer must watch the skier at all times and keep the driver informed of the skiers hand signals or if the skier is in trouble.
12. The boat driver must always give full attention to driving and operating the boat.
13. Give immediate attention to a downed skier. Other boats may not see him or her.
14. Turn off the engines when approaching the skier. Drive the boat carefully in the vicinity of the downed skier. Approach the skier from the lee side (opposite the direction of the wind).
15. Do not swamp the boat when retrieving a skier.
16. Never back up to anyone in the water.
17. Never drive a boat behind a water skier. Should the skier fall you may hit him or her.
18. Always observe local restrictions on length of tow line.
19. Understand and use water skiing hand signals.
20. Always be considerate of others.
21. Non-swimmers should never ski.

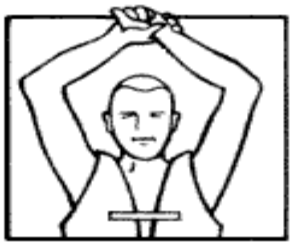
Understanding hand signals is critical to safe skiing. All parties should agree to what each signal means to prevent confusion. The more common signals are illustrated below.



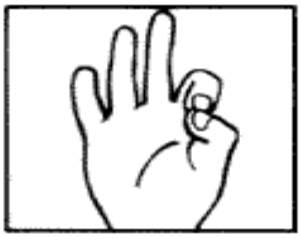
Left Turn
Arm outstretched pointing left



Right Turn
Arm outstretched pointing right



Skier OK
Hands clenched together overhead



Speed OK
Raised arm with thumb and finger joined to form circle

Back to Dock
Pat top of head

Stop
Hand up, palm forward

Slower
Palm or thumb pointing down

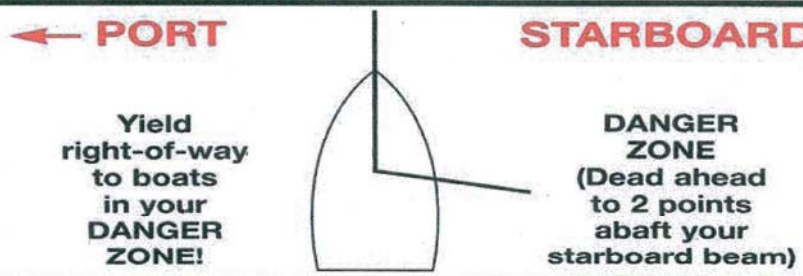
Faster
Palm or thumb pointing up

Retrieval
One ski extended out of the water

NAVIGATIONAL AIDS CHART

REMEMBER THESE RULE

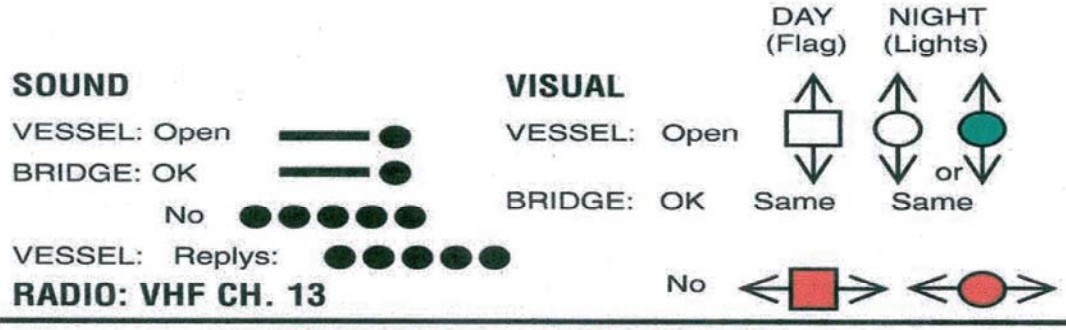
1. OVERTAKING - PASSING: Boat being passed has the right-of way. KEEP CLEAR.
2. MEETING HEAD ON: Keep to the right.
3. CROSSING: Boat on right has the right-of-way. Slow down and permit boat to pass.



WHISTLE SIGNALS

ONE LONG BLAST: Warning signal (Coming out of slip)
ONE SHORT BLAST: Pass on my port side
TWO SHORT BLASTS: Pass on my starboard side
THREE SHORT BLASTS: Engine(s) in reverse
FOUR OR MORE BLASTS: Danger signal

BRIDGE SIGNALS



STORM WARNINGS

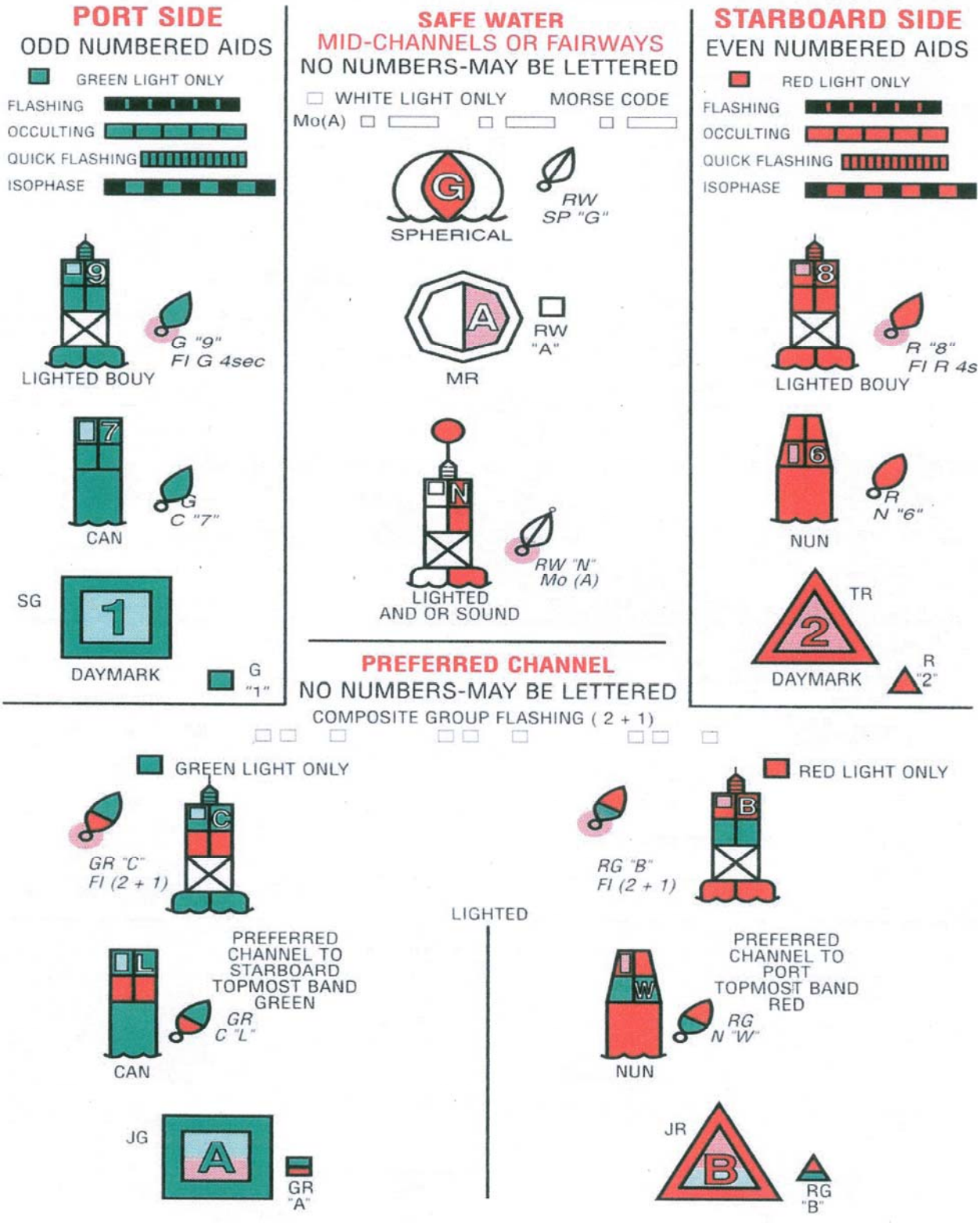
RED FLAG Small craft (winds to 33 knots)

2 RED FLAGS Gale (winds up to 47 knots)

SQUARE RED FLAG BLACK BOX (Storm)

2 SQUARE RED FLAGS BLACK BOX (Hurricane)

LATERAL AIDS AS SEEN ENTERING FROM SEAWARD



APPENDIX E

Maintenance Log Forms

This appendix contains a maintenance log which you can copy and use to document maintenance actions performed on this vessel.

It is not mandatory that you use this specific log to document maintenance actions, as you may have a preference for a certain style of maintenance log available on the open market. It is, however, important that you keep some type of maintenance log which documents every maintenance action taken on the vessel.

The log may serve as an excellent indicator of potential problems as well as a record of service required by warranties and service agreements.

MAINTENANCE LOG

DATE	ENGINE HOURS	MAINTENANCE ACTION	COMPANY/ TECHNICIAN	COST

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- **Above board** – On or above the deck, in plain view, not hiding anything.
- **Above-water hull** – The hull section of a vessel above waterline, the visible part of a ship. Also, topsides.
- **Abaft** – Toward the stern, relative to some object ("abaft the fore hatch").
- **Abaft the beam** – Further aft than the beam: a relative bearing of greater than 90 degrees from the bow: "two points abaft the port beam".
- **Abandon ship!** – An imperative to leave the vessel immediately, usually in the face of some imminent danger.
- **Abeam** – *On the beam*, a relative bearing at right angles to the centerline of the ship's keel.
- **Aboard** – On or in a vessel.
- **Absolute bearing** – The bearing of an object in relation to north. Either *true bearing*, using the geographical or true north, or *magnetic bearing*, using magnetic north. See also "bearing" and "relative bearing".
- **Accommodation ladder** – A portable flight of steps down a ship's side.
- **Adrift** – Afloat and unattached in any way to the shore or seabed, but not under way. It implies that a vessel is not under control and therefore goes where the wind and current take her (*loose from moorings* or *out of place*). Also refers to any gear not fastened down or put away properly. It can also be used to mean "absent without leave".
- **Aft** – Towards the stern (of the vessel).
- **Afloat** – Of a vessel which is floating freely (not aground or sunk). More generally of vessels in service ("the company has 10 ships afloat").
- **Aground** – Resting on or touching the ground or bottom.
- **Ahead** – Forward of the bow.
- **Ahoy** – A cry to draw attention. Term used to hail a boat or a ship, as "*Boat ahoy!*"
- **Aid to Navigation** – (ATON) Any device external to a vessel or aircraft specifically intended to assist navigators in determining their position or safe course, or to warn them of dangers or obstructions to navigation.
- **Aloft** – Above the ship's uppermost solid structure; overhead or high above.
- **Alongside** – By the side of a ship or pier.
- **Amidships (or midships)** – In the middle portion of ship, along the line of the keel.
- **Anchor** – An object designed to prevent or slow the drift of a ship, attached to the ship by a line or chain; typically a metal, hook-like or plough-like object designed to grip the bottom under the body of water (but also see *sea anchor*).
- **Anchorage** – A suitable place for a ship to anchor. Area of a port or harbor.
- **Anchor's aweigh** – Said of an anchor when just clear of the bottom.
- **Anchor buoy** – A small buoy secured by a light line to anchor to indicate position of anchor on bottom.
- **Anchor chain** or **anchor cable** – Chain connecting the ship to the anchor.
- **Anchor light** – White light displayed by a ship at anchor. Two such lights are displayed by a ship over 150 feet (46 m) in length.
- **Anchor watch** – Making sure that the anchor is holding and the vessel is not drifting. Important during rough weather and at night. Most marine GPS units have an Anchor Watch alarm capability.
- **Arc of Visibility** – The portion of the horizon over which a lighted aid to navigation is visible from seaward.
- **Ashore** – On the beach, shore or land.
- **Astern** – Toward the stern; an object or vessel that is abaft another vessel or object.
- **Asylum Harbor** – A harbor used to provide shelter from a storm.
- **Athwart, athwart ships** – At right angles to the fore and aft or centerline of a ship
- **Avast** – Stop! Cease or desist from whatever is being done.
- **Awash** – So low in the water that the water is constantly washing across the surface.
- **Aweigh** – Position of an anchor just clear of the bottom.
- **Aye, aye** – Reply to an order or command to indicate that it, firstly, is heard; and, secondly, is understood and will be carried out. ("Aye, aye, sir" to officers). Also "yarr".
- **Azimuth compass** – An instrument employed for ascertaining position of the sun with respect to magnetic north. The azimuth of an object is its bearing from the observer measured as an angle clockwise from true north.
- **Azimuth circle** – Instrument used to take bearings of celestial objects.
- **Bank** – A large area of elevated sea floor.
- **Bar** – Large mass of sand or earth, formed by the surge of the sea. They are mostly found at the entrances of great rivers or havens, and often render navigation extremely dangerous, but confer tranquility once inside. See also: Touch and go, grounding. Alfred Lord Tennyson's poem "Crossing the bar", an allegory for death.
- **Barrel man** – A sailor that was stationed in the crow's nest.
- **Bar pilot** – A bar pilot guides ships over the dangerous sandbars at the mouth of rivers and bays.

- **Beaching** – Deliberately running a vessel *aground*, to load and unload (as with landing craft), or sometimes to prevent a damaged vessel sinking.
- **Beacon** – A lighted or unlighted fixed aid to navigation attached directly to the earth's surface. (Lights and daybeacons both constitute beacons.)
- **Beam** – The width of a vessel at the widest point, or a point alongside the ship at the mid-point of its length.
- **Beam ends** – The sides of a ship. "On her beam ends" may mean the vessel is literally on her side and possibly about to capsize; more often, the phrase means the vessel is listing 45 degrees or more.
- **Bearing** – The horizontal direction of a line of sight between two objects on the surface of the earth. See also "absolute bearing" and "relative bearing".
- **Beaufort scale** – The scale describing wind force devised by Admiral Sir Francis Beaufort in 1808, in which winds are graded by the effect of their force (originally, the amount of sail that a fully-rigged frigate could carry). Scale now reads up to Force 17.
- **Bend** – A knot used to join two ropes or lines. Also see *hitch*.
- **Belay** – To make fast a line around a fitting, usually a cleat or belaying pin. An order to halt a current activity or countermand an order prior to execution.
- **Belaying pins** – Bars of iron or hard wood to which running rigging may be secured, or *belayed*.
- **Berth** – A bed on a boat, or a space in a port or harbor where a vessel can be tied up.
- **Best bower (anchor)** – The larger of two anchors carried in the bow; so named as it was the last, *best* hope.
- **Bight** – A loop in rope or line: a hitch or knot tied "on the bight" is one tied in the middle of the rope, without access to the ends. An indentation in a coastline.
- **Bilge** – The bilge is the compartment at the bottom of the hull of a ship or boat where water collects so that it may be pumped out of the vessel at a later time.
- **Bilged on her anchor** – A ship that has run upon her own anchor, so the anchor cable runs under the hull.
- **Bimini** – Weather-resistant fabric stretched over a stainless steel frame, fastened above the cockpit of a sailboat or fly bridge of a power yacht which serves as a rain or sun shade.
- **Binnacle** – The stand on which the ship's compass is mounted.
- **Bitter end** – The anchor cable is tied to the bitts, when the cable is fully paid out, the bitter end has been reached. The last part of a rope or cable.
- **Boat** – A craft or vessel designed to float on, and provide transport over, water.
- **Bombay runner** – Large cockroach.
- **Booby** – A type of bird that has little fear and therefore is particularly easy to catch.
- **Booby hatch** – A sliding hatch or cover.
- **Buoy** – A floating object of defined shape and color, which is anchored at a given position and serves as an aid to navigation.
- **Bow** – The front of a ship.
- **Bowline** – A type of knot, producing a strong loop of a fixed size, topologically similar to a sheet bend. Also a rope attached to the side of a sail to pull it towards the bow (for keeping the windward edge of the sail steady).
- **Box the compass** – To state all 32 points of the compass, starting at north, proceeding clockwise. Sometimes applied to a wind that is constantly shifting.
- **Brake** – The handle of the pump, by which it is worked.
- **Brass monkey** or **brass monkey weather** – Very cold weather, origin unknown.
- **Bridge** – A structure above the weather deck, extending the full width of the vessel, which houses a command centre, itself called by association, the bridge.
- **Bulkhead** – An upright wall within the hull of a ship. Particularly a load bearing wall.
- **Bumboat** – A private boat selling goods.
- **Buoyed up** – Lifted by a buoy, especially a cable that has been lifted to prevent it from trailing on the bottom.
- **By the board** – Anything that has gone overboard.
- **Cabin** – an enclosed room on a deck or flat.
- **Cable** – A large rope; also a measure of length or distance. Equivalent to (UK) 1/10 nautical mile, approx. 600 feet; (USA) 120 fathoms, 720 feet (219 m); other countries use different values.
- **Canoe stern** – A design for the stern of a yacht which is pointed, like a bow, rather than squared off as a transom.
- **Capsize** – When a ship or boat lists too far and rolls over, exposing the keel. On large vessels, this often results in the sinking of the ship.
- **Capstan** – A large winch with a vertical axis. Used to wind in anchors or other heavy objects.
- **Cardinal** – Referring to the four main points of the compass: north, south, east and west. See also "bearing".
- **Careening** – Cause the ship to tilt on its side, usually to clean or repair the hull below the water line.
- **Catamaran** – A vessel with two hulls.
- **Centerboard** – A board or plate lowered through the hull of a dinghy on the centerline to resist leeway.

- **Chafing gear** – Material applied to a line or spar to prevent or reduce chafing.
- **Chine** – A relatively sharp angle in the hull, as compared to the rounded bottoms of most traditional boat hulls. A line formed where the sides of a boat meet the bottom. Soft chine is when the two sides join at a shallow angle, and hard chine is when they join at a steep angle.
- **Clean bill of health** – A certificate issued by a port indicating that the ship carries no infectious diseases. Also called a pratique.
- **Cleat** – A stationary device used to secure a rope aboard a vessel.
- **Close aboard** – Near a ship.
- **Coaming** – The raised edge of a hatch, cockpit or skylight to help keep out water.
- **Companionway** – A raised and windowed hatchway in the ship's deck, with a ladder leading below and the hooded entrance-hatch to the main cabins.
- **Compass** – Navigational instrument that revolutionized travel.
- **Corrector** – a device to correct the ship's compass.
- **Coxswain** or **cockswain** – The helmsman or crew member in command of a boat.
- **As the crow flies** – A direct line between two points (which might cross land) which is the way crows travel rather than ships which must go around land.
- **Crow's nest** – Specifically a masthead constructed with sides and sometimes a roof to shelter the lookouts from the weather, generally by whaling vessels, this term has become a generic term for what is properly called masthead. See masthead.
- **Crutches** – Metal Y shaped pins to hold oars whilst rowing.
- **Cuddy** – A small cabin in a boat.
- **Cut splice** – A join between two lines, similar to an eye-splice, where each rope end is joined to the other a short distance along, making an opening which closes under tension..
- **Cut and run** – When wanting to make a quick escape, a ship might cut lashings to sails or cables for anchors, causing damage to the rigging, or losing an anchor, but shortening the time needed to make ready by bypassing the proper procedures.
- **Daggerboard** – A type of centerboard that is lifted vertically; often used in pairs.
- **Davy Jones's Locker** – An idiom for the bottom of the sea.
- **Daybeacon** – An unlighted fixed structure which is equipped with a dayboard for daytime identification.
- **Dayboard** – The daytime identifier of an aid to navigation presenting one of several standard shapes (square, triangle, rectangle) and colors (red, green, white, orange, yellow, or black).
- **Deadrise** – The design angle between the keel (q.v.) and horizontal.
- **Decks** – the structures forming the approximately horizontal surfaces in the ship's general structure. Unlike flats, they are a structural part of the ship.
- **Deckhead** – The under-side of the deck above. Sometimes paneled over to hide the pipe work. This paneling, like that lining the bottom and sides of the holds, is the ceiling.
- **Directional light** – A light illuminating a sector or very narrow angle and intended to mark a direction to be followed.
- **Dolphin** – A structure consisting of a number of piles driven into the seabed or riverbed in a circular pattern and drawn together with wire rope.
- **Draft** or **draught** – The depth of a ship's keel below the waterline.
- **Dunnage** – Loose packing material used to protect a ship's cargo from damage during transport. Personal baggage.
- **Echo sounding** – Measuring the depth of the water using a sonar device. Also see *sounding* and *swinging the lead*.
- **Extremis** – (also known as "in extremis") the point under International Rules of the Road (Navigation Rules) at which the privileged (or stand-on) vessel on collision course with a burdened (or give-way) vessel determines it must maneuver to avoid a collision. Prior to extremis, the privileged vessel must maintain course and speed and the burdened vessel must maneuver to avoid collision
- **Fair** – A smooth curve, usually referring to a line of the hull which has no deviations. To make something flush. A rope is fair when it has a clear run. A wind or current is fair when it offers an advantage to a boat.
- **Fast** – Fastened or held firmly (*fast aground*: stuck on the seabed; *made fast*: tied securely).
- **Fathom** – A unit of length equal to 6 feet (1.8 m), roughly measured as the distance between a man's outstretched hands.
- **Fender** – An air or foam filled bumper used in boating to keep boats from banging into docks or each other.
- **Fid** – A tapered wooden tool used for separating the strands of rope for splicing.
- **Figurehead** – symbolic image at the head of a traditional sailing ship or early steamer.
- **First Mate** – The Second in command of a ship.
- **Flank** – The maximum speed of a ship. Faster than "full speed".
- **Flare** – A curvature of the topsides outward towards the gunwale. A pyrotechnic signaling device usually used to indicate distress.
- **Flotsam** – Debris or cargo that remains afloat after a shipwreck. See also jetsam.

- **Following sea** – Wave or tidal movement going in the same direction as a ship.
- **Forecastle** – A partial deck, above the upper deck and at the head of the vessel; traditionally the sailors' living quarters. The name is derived from the castle fitted to bear archers in time of war.
- **Forward** – Towards the bow (of the vessel).
- **Founder** – To fill with water and sink.
- **Fore, foreward** – Towards the bow (of the vessel).
- **Forefoot** – The lower part of the stem of a ship.
- **Foul** – The opposite of clear. For instance, a rope is foul when it neither does nor run straight or smoothly, and an anchor is foul when it is caught on an obstruction. A breach of racing rules.
- **Frame** – A transverse structural member that gives the hull strength and shape. A bent frame is called a timber.
- **Freeboard** – The height of a ship's hull (excluding superstructure) above the waterline. The vertical distance from the current waterline to the lowest point on the highest continuous watertight deck. This usually varies from one part to another.
- **Gaff** – A long hook with a sharp point to haul fish in.
- **Gam** – A meeting of two (or more) whaling ships at sea. The ships each send out a boat to the other, and the two captains meet on one ship, while the two chief mates meet on the other.[3]
- **Gammon iron** – The bow fitting which clamps the bowsprit to the stem.
- **Galley** – the kitchen of the ship
- **Gangplank** – A movable bridge used in boarding or leaving a ship at a pier; also known as a "brow".
- **Gangway** – An opening in the bulwark of the ship to allow passengers to board or leave the ship.
- **Garbled** – Garbling was the (illegal) practice of mixing cargo with garbage.
- **Garboard** – The strake closest to the keel (from Dutch *gaarboard*).
- **Garboard planks** – The planks immediately either side of the keel.
- **Global Positioning System** – (GPS) A satellite based radionavigation system providing continuous worldwide coverage. It provides navigation, position, and timing information to air, marine, and land users.
- **Grave** – To clean a ship's bottom.
- **Groggy** – Drunk from having consumed a lot of grog.
- **Ground** – The bed of the sea.
- **Grounding** – When a ship (while afloat) touches the bed of the sea, or goes "aground"
- **Gunwale** – Upper edge of the hull.
- **Hammock** – Canvas sheets, slung from the deck head in mess decks, in which seamen slept. "Lash up and stow" a piped command to tie up hammocks and stow them (typically) in racks inboard of the ship's side to protect crew from splinters from shot and provide a ready means of preventing flooding caused by damage.
- **Handy billy** – A loose block and tackle with a hook or tail on each end, which can be used wherever it is needed. Usually made up of one single and one double block.
- **Hand bomber** – A ship using coal-fired boilers shoveled in by hand.
- **Hand over fist** – To climb steadily upwards, from the motion of a sailor climbing shrouds on a sailing ship (originally "hand over hand").
- **Handsomely** – With a slow even motion, as when hauling on a line "handsomely".
- **Harbor** – A harbor or haven, is a place where ships may shelter from the weather or are stored. Harbors can be man-made or natural.
- **Hard** – A section of otherwise muddy shoreline suitable for mooring or hauling out.
- **Hardtack** – A hard and long-lasting dry biscuit, used as food on long journeys. Also called *ship's biscuit*.
- **Hatchway, hatch** – A covered opening in a ship's deck through which cargo can be moved or access made to a lower deck; the cover to the opening is called a hatch.
- **Hawse-hole** – A hole in a ship's bow for a cable or chain, such as for an anchor, to pass through.
- **Head** – The toilet or latrine of a vessel, which for sailing ships projected from the bows
- **Head of navigation** – A term used to describe the farthest point above the mouth of a river that can be navigated by ships.
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- **Heave** – A vessel's transient, vertical, up-and-down motion.
- **Heave down** – Turn a ship on its side (for cleaning).
- **Helmsman** – A person who steers a ship
- **Hitch** – A knot used to tie a rope or line to a fixed object. Also see *bend*.
- **Hold** –In later merchant vessels it extended up through the decks to the underside of the weather deck.
- **Holiday** – A gap in the coverage of newly applied paint, slush, tar or other preservative.
- **Holystone** – A chunk of sandstone used to scrub the decks. The name comes from both the kneeling position sailors adopt to scrub the deck (reminiscent of genuflection for prayer), and the stone itself (which resembled a Bible in shape and size).

- **Horn timber** – A fore-and-aft structural member of the hull sloping up and backwards from the keel to support the counter.
- **Hull** – The shell and framework of the basic flotation-oriented part of a ship
- **Hydrofoil** – A boat with wing-like foils mounted on struts below the hull.
- **Icing** – A serious hazard where cold temperatures (below about -10°C) combined with high wind speed (typically force 8 or above on the Beaufort scale) result in spray blown off the sea freezing immediately on contact with the ship.
- **Inglefield clip** – A type of clip for attaching a flag to a flag halyard.
- **In the offing** – In the water visible from on board a ship, now used to mean something imminent.
- **Inboard-Outboard drive system** – A larger Power Boating alternative drive system to transom mounted outboard motors.
- **In-water survey** – a method of surveying the underwater parts of a ship while it is still afloat instead of having to dry-dock it for examination of these areas as was conventionally done.
- **Jack** – 1 – A sailor. Also *jack tar* or just *tar*. 2 – A flag. Typically the flag was talked about as if it were a member of the crew. Strictly speaking, a flag is only a "jack" if it is worn at the jack staff at the bow of a ship.
- **Jack lines** or **jack stays** – Lines, often steel wire with a plastic jacket, from the bow to the stern on both port and starboard. The Jack Lines are used to clip on the safety harness to secure the crew to the vessel while giving them the freedom to walk on the deck.
- **Jetsam** – Debris ejected from a ship that sinks or washes ashore. See also flotsam.
- **Keel** – The central structural basis of the hull.
- **Keelhauling** – Maritime punishment: to punish by dragging under the keel of a ship.
- **Killick** – A small anchor.
- **Knee** – Connects two parts roughly at right angles, eg. deck beams to frames.
- **Knot** – A unit of speed: one nautical mile (1.852 kilometers) per hour. Originally speed was measured by paying out a line from the stern of a moving boat. The line had a knot every 47 feet 3 inches (14.4 m), and the number of knots passed out in 30 seconds gave the speed through the water in nautical miles per hour.
- **Know the ropes** – A sailor who 'knows the ropes' is familiar with the miles of cordage and ropes involved in running a ship
- **Ladder** – On board a ship, all "stairs" are called ladders, except for literal staircases aboard passenger ships. Most "stairs" on a ship are narrow and nearly vertical, hence the name. Believed to be from the Anglo-Saxon word hiaeder, meaning ladder.
- **Land lubber** – A person unfamiliar with being on the sea.
- **Lanyard** – A rope that ties something off.
- **Lateral system** – A system of aids to navigation in which characteristics of buoys and beacons indicate the sides of the channel or route relative to a conventional direction of buoyage (usually upstream).
- **Lay** – To come and go, used in giving orders to the crew, such as "lay forward" or "lay aloft". To direct the course of vessel. Also, to twist the strands of a rope together.
- **Lazarette** – Small stowage locker at the aft end of a boat.
- **League** – A unit of length, normally equal to three nautical miles.
- **Lee side** – The side of a ship sheltered from the wind
- **Leeward** – In the direction that the wind is blowing towards.
- **Lifebelt, lifejacket, life preserver** or **Mae West** – A device such as a buoyant ring or inflatable jacket which keeps a person afloat in the water.
- **Lifeboat** – 1. Shipboard lifeboat kept on board a vessel and used to take crew and passengers to safety in the event of the ship being abandoned. 2. Rescue lifeboat, usually launched from shore, used to rescue people from the water or from vessels in difficulty.
- **Life raft** – An inflatable, covered raft, used in the event of a vessel being abandoned.
- **Line** – the correct nautical term for the majority of the cordage or "ropes" used on a vessel. A line will always have a more specific name, such as mizzen topsail halyard, which describes its use.
- **Liner** – Ship of the line: a major warship capable of taking its place in the main (battle) line of fighting ships. Hence modern term for most prestigious passenger vessels: Liner.
- **List** – The vessel's angle of lean or tilt to one side, in the direction called roll.
- **Loaded to the gunwales** – Literally, having cargo loaded as high as the ship's rail; also means extremely drunk.
- **Loose cannon** – An irresponsible and reckless individual whose behavior (either intended or unintended) endangers the group he or she belongs to. Loose cannon, weighing thousands of pounds, would crush anything and anyone in its path, and possibly even break a hole in the hull, thus endangering the seaworthiness of the whole ship.
- **Lubber's line** – A vertical line inside a compass case indicating the direction of the ship's head.
- **Mae West** – A Second World War personal flotation device used to keep people afloat in the water; named after the 1930s actress Mae West, well-known for her pneumatic torso.
- **Magnetic bearing** – An absolute bearing using magnetic north.
- **Magnetic north** – The direction towards the magnetic north pole. Varies slowly over time.
- **Man overboard!** – A cry let out when a seaman has gone overboard.

- **Master** – Either the commander of commercial vessel or a senior officer of a naval sailing ship in charge of routine seamanship and navigation but not in command during combat.
- **Mess** – An eating place aboard ship. A group of crew who live and feed together,
- **Monkey fist** – a ball woven out of line used to provide heft to heave the line to another location. The monkey fist and other heaving-line knots were sometimes weighted with lead.
- **Moor** – to attach a boat to a mooring buoy or post. Also, to a dock a ship.
- **Mould** – A template of the shape of the hull in transverse section. Several moulds are used to form a temporary framework around which a hull is built.
- **Nautical mile** – A distance of 1,852 meters. Approximately the distance of one minute of arc of latitude on the earth's surface. A speed of one nautical mile per hour is called a *knot*.
- **Navigation rules** – Rules of the road that provide guidance on how to avoid collision and also used to assign blame when a collision does occur.
- **Oilskins** or **oilies** – Foul-weather clothing worn by sailors.
- **Orlop deck** The lowest deck of a ship of the line. The deck covering in the hold.
- **Outward bound** – To leave the safety of port, heading for the open ocean.
- **Overfall** – Dangerously steep and breaking seas due to opposing currents and wind in a shallow area.
- **Overhead** – the "ceiling or, essentially, the bottom of the deck above you.
- **Overwhelmed** – Capsized or foundered.
- **Ox-eye** – A cloud or other weather phenomenon that may be indicative of an upcoming storm.
- **Panting** – The pulsation in and out of the bow and stern plating as the ship alternately rises and plunges deep into the water
- **Pilot** – Navigator. A specially knowledgeable person qualified to navigate a vessel through difficult waters, e.g. harbor pilot etc.
- **Pipe (Bos'n's)**, or a **bos'n's call** – A whistle used by Boatswains (bosuns or bos'ns) to issue commands. Consisting of a metal tube which directs the breath over an aperture on the top of a hollow ball to produce high pitched notes. The pitch of the notes can be changed by partly covering the aperture with the finger of the hand in which the pipe is held. The shape of the instrument is similar to that of a smoking pipe.
- **Pipe down** – A signal on the bosun's pipe to signal the end of the day, requiring lights (and smoking pipes) to be extinguished and silence from the crew.
- **Pitch** – A vessel's motion, rotating about the beam/transverse axis, causing the fore and aft ends to rise and fall repetitively. The theoretical distance a propeller moves forward with each revolution.
- **Pitchpole** – To capsize a boat end over end, rather than by rolling over.
- **Pontoon** – A flat-bottomed vessel used as a ferry, barge, car float or a float moored alongside a jetty or a ship to facilitate boarding.
- **Poop deck** – A high deck on the aft superstructure of a ship.
- **Pooped** – Swamped by a high, following sea. Exhausted.
- **Port** – Towards the left-hand side of the ship facing forward (formerly Larboard). Denoted with a red light at night.
- **Porthole** or **port** – an opening in a ship's side, esp. a round one for admitting light and air, fitted with thick glass and, often, a hinged metal cover, a window.
- **Propeller walk** or **prop walk** – tendency for a propeller to push the stern sideways. In theory a right hand propeller in reverse will walk the stern to port.
- **Prow** – a poetical alternative term for bows.
- **Purchase** – A mechanical method of increasing force, such as a tackle or lever.
- **Quayside** – Refers to the dock or platform used to fasten a vessel to.
- **Rabbet** or **rebate** – A groove cut in wood to form part of a joint.
- **Radar** – Acronym for RAdio Detection And Ranging. An electronic system designed to transmit radio signals and receive reflected images of those signals from a "target" in order to determine the bearing and distance to the "target".
- **Radar reflector** – A special fixture fitted to a vessel or incorporated into the design of certain aids to navigation to enhance their ability to reflect radar energy. In general, these fixtures will materially improve the visibility for use by vessels with radar.
- **Range lights** – Two lights associated to form a range (a line formed by the extension of a line connecting two charted points) which often, but not necessarily, indicates the channel centerline. The front range light is the lower of the two, and nearer to the mariner using the range. The rear light is higher and further from the mariner.
- **Reef** - Rock or coral, possibly only revealed at low tide, shallow enough that the vessel will at least touch if not go aground.
- **Relative bearing** – A bearing relative to the direction of the ship: the clockwise angle between the ship's direction and an object. See also "absolute bearing" and "bearing".
- **Righting couple** – The force which tends to restore a ship to equilibrium once a heel has altered the relationship between her centre of buoyancy and her centre of gravity.

- **Roll** – A vessel's motion rotating from side to side, about the fore-aft/longitudinal axis. List is a lasting tilt in the roll direction.
- **Rowlock** – A bracket providing the fulcrum for an oar. Also see *thole*.
- **Rubbing strake** – An extra plank fitted to the outside of the hull, usually at deck level, to protect the topsides.
- **Sagging** – When a trough of a wave is amidships, causing the hull to deflect so that the ends of the keel are higher than the middle. The opposite to hogging.
- **Sampson post** – A strong vertical post used to support a ship's windlass and the heel of a ship's bowsprit.
- **Scow** – A type of clinker dinghy, characteristically beamy and slow.
- **Scud** – A name given by sailors to the lowest clouds, which are mostly observed in squally weather.
- **Scudding** – A term applied to a vessel when carried furiously along by a tempest.
- **Scuppers** – Originally a series of pipes fitted through the ships side from inside the thicker deck waterway to the topside planking to drain water overboard.
- **Scuttle** – A small opening, or lid thereof, in a ship's deck or hull. To cut a hole in, or sink something.
- **Scuttlebutt** – A barrel with a hole in used to hold water that sailors would drink from. Also: gossip.
- **Sea anchor** – A stabilizer deployed in the water for heaving to in heavy weather. It acts as a brake and keeps the hull in line with the wind and perpendicular to waves.
- **Sea boots** - High waterproof boots for use at sea. In leisure sailing known as *sailing wellies*.
- **Sea chest** – A watertight box built against the hull of the ship communicating with the sea through a grillage, to which valves and piping are attached to allow water in for ballast, engine cooling, and firefighting purposes.
- **Seacock** – a valve in the hull of a boat.
- **Seaworthy** – Certified for, and capable of, safely sailing at sea.
- **Sheer** – The upward curve of a vessel's longitudinal lines as viewed from the side.
- **Sextant** – Navigational instrument used to measure a ship's latitude and longitude.
- **Ship** –Generally now used to describe most medium or large vessels outfitted with smaller boats. As a consequence of this submarines may be larger than small ships, but are called boats because they do not carry boats of their own.
- **Ship's bell** – Striking the ship's bell is the traditional method of marking time and regulating the crew's watches. (The only rope on a ship is attached to the ships bell).
- **Shoal** – Shallow water that is a hazard to navigation.
- **Shoal draught** – A vessel with shallow draught, so capable of sailing in unusually shallow water.
- **Skeg** – A downward or sternward projection from the keel in front of the rudder. Protects the rudder from damage, and in *bilge keelers* may provide one "leg" of a tripod on which the boat stands when the tide is out.
- **Skipper** – The captain of a ship.
- **Small bower (anchor)** – The smaller of two anchors carried in the bow.
- **Sonar** – A method of using sound pulses to detect, range and sometime image underwater targets and obstacles, or the bed of the sea. Also see *echo sounding* and *ASDIC*.
- **Sou'wester** - A storm from the south west. A type of waterproof hat with a wide brim over the neck, worn in storms.
- **Sounding** – Measuring the depth of the water. Traditionally done by *swinging the lead*, now commonly by echo sounding.
- **Spindrift** – Finely-divided water swept from crest of waves by strong winds.
- **Splice** – To join lines (ropes, cables etc.) by unraveling their ends and intertwining them to form a continuous line. To form an eye or a knot by splicing.
- **Squared away** –The term is applied to situations and to people figuratively to mean that all difficulties have been resolved or that the person is performing well and is mentally and physically prepared.
- **Squat effect** is the phenomenon by which a vessel moving quickly through shallow water creates an area of lowered pressure under its keel that reduces the ship's buoyancy, particularly at the bow. The reduced buoyancy causes the ship to "squat" lower in the water than would ordinarily be expected, and thus its effective draught is increased.
- **Stanchion** – vertical post near a deck's edge that supports life-lines.
- **Starboard** – Towards the right-hand side of a vessel facing forward. Denoted with a green light at night. Derived from the old steering oar or 'steerboard' which preceded the invention of the rudder.
- **Steering oar** or **steering board** – A long, flat board or oar that went from the stern to well underwater, used to control the vessel in the absence of a rudder..
- **Stem** – The extension of keel at the forward end of a ship.
- **Stern** – The rear part of a ship, technically defined as the area built up over the sternpost, extending upwards from the counter to the taffrail.
- **Stern tube** – The tube under the hull to bear the tailshaft for propulsion (usually at stern).
- **Stopper knot** – A knot tied in the end of a rope, usually to stop it passing through a hole; most commonly a figure-of-eight knot.
- **Strake** – One of the overlapping boards in a clinker built hull.

- **Sway** – A vessel's lateral motion from side to side. (v) To hoist: "Sway up my dunnage".
- **Swinging the compass** – Measuring the accuracy in a ship's magnetic compass so its readings can be adjusted – often by turning the ship and taking bearings on reference points.
- **Swinging the lead** – Measuring the depth of water beneath a ship using a lead-weighted sounding line.
- **Tailshaft** – A kind of metallic shafting (a rod of metal) to hold the propeller and connected to the power engine. When the tailshaft is moved, the propeller may also be moved for propulsion.
- **Thole** – Vertical wooden peg or pin inserted through the gunwale to form a fulcrum for oars when rowing. Used in place of a *rowlock*.
- **Thwart** – A bench seat across the width of an open boat.
- **Tingle** – A thin temporary patch.
- **Toe-rail** – A low strip running around the edge of the deck like a low bulwark. It may be shortened or have gaps in it to allow water to flow off the deck.
- **Topsides** – the part of the hull between the waterline and the deck. Also, Above-water hull
- **Touch and go** – The bottom of the ship touching the bottom, but not grounding.
- **Towing** – The operation of drawing a vessel forward by means of long lines.
- **Traffic Separation Scheme** – Shipping corridors marked by buoys which separate incoming from outgoing vessels. Improperly called *Sea Lanes*.
- **Transom** – a more or less flat surface across the stern of a vessel. Dinghies tend to have almost vertical transoms, whereas yachts' transoms may be raked forward or aft.
- **Trice** – To haul and tie up by means of a rope.
- **Trick** – A period of time spent at the wheel (*"my trick's over"*).
- **Trim** – Relationship of ship's hull to waterline.
- **True bearing** – An absolute bearing using true north.
- **True north** – The direction of the geographical North Pole.
- **Turn** – A knot passing behind or around an object.
- **Under way** – A vessel that is moving under control: that is, neither at anchor, made fast to the shore, aground nor adrift.
- **Underwater hull** or *underwater ship* – The underwater section of a vessel beneath the waterline, normally not visible except when in drydock.
- **Vanishing angle** – The maximum degree of heel after which a vessel becomes unable to return to an upright position.
- **V-hull** – The shape of a boat or ship which the shape of the hull comes to a straight line to the keel.
- **Wake** – Turbulence behind a vessel. Not to be confused with *wash*.
- **Wash** – The waves created by a vessel. Not to be confused with *wake*.
- **Waterway** – A strake of timber laid against the frames or bulwark stanchions at the margin of a laid wooden deck, usually about twice the thickness of the deck plank.
- **Waypoint** – A location defined by navigational coordinates, especially as part of a planned route.
- **Weather side** – The side of a ship exposed to the wind.
- **Weigh anchor** – To heave up (an anchor) preparatory to sailing.
- **Wells** – Places in the ship's hold for the pumps.
- **White horses** or **whitecaps** – Foam or spray on wave tops caused by stronger winds (usually above Force 4).
- **Wheelhouse** – Location on a ship where the steering wheel is located, often interchanged with pilothouse and bridge.
- **Wide berth** – To leave room between two ships moored (berthed) to allow space for maneuver.
- **Windage** – Wind resistance of the boat.
- **Windbound** – A condition wherein the ship is detained in one particular station by contrary winds.
- **Wind-over-tide** – Sea conditions with a tidal current and a wind in opposite directions, leading to short, heavy seas.
- **Windward** – In the direction that the wind is coming from.
- **Windlass** – A winch mechanism, usually with a horizontal axis. Used where mechanical advantage greater than that obtainable by block and tackle was needed (such as raising the anchor on small ships).
- **Worm, serve, and parcel** – To protect a section of rope from chafing by: laying yarns (worming) to fill in the buntlines, wrapping marline or other small stuff (serving) around it, and stitching a covering of canvas (parceling) over all.
- **Yard** – The horizontal spar from which a square sail is suspended.
- **Yardarm** – The very end of a yard. Often mistaken for a "yard", which refers to the entire spar. As in to hang "from the yardarm" and the sun being "over the yardarm" (late enough to have a drink).
- **Yarr** – Acknowledgement of an order, or agreement. Also *aye, aye*.
- **Yaw** – A vessel's rotational motion about the vertical axis, causing the fore and aft ends to swing from side to side repetitively.

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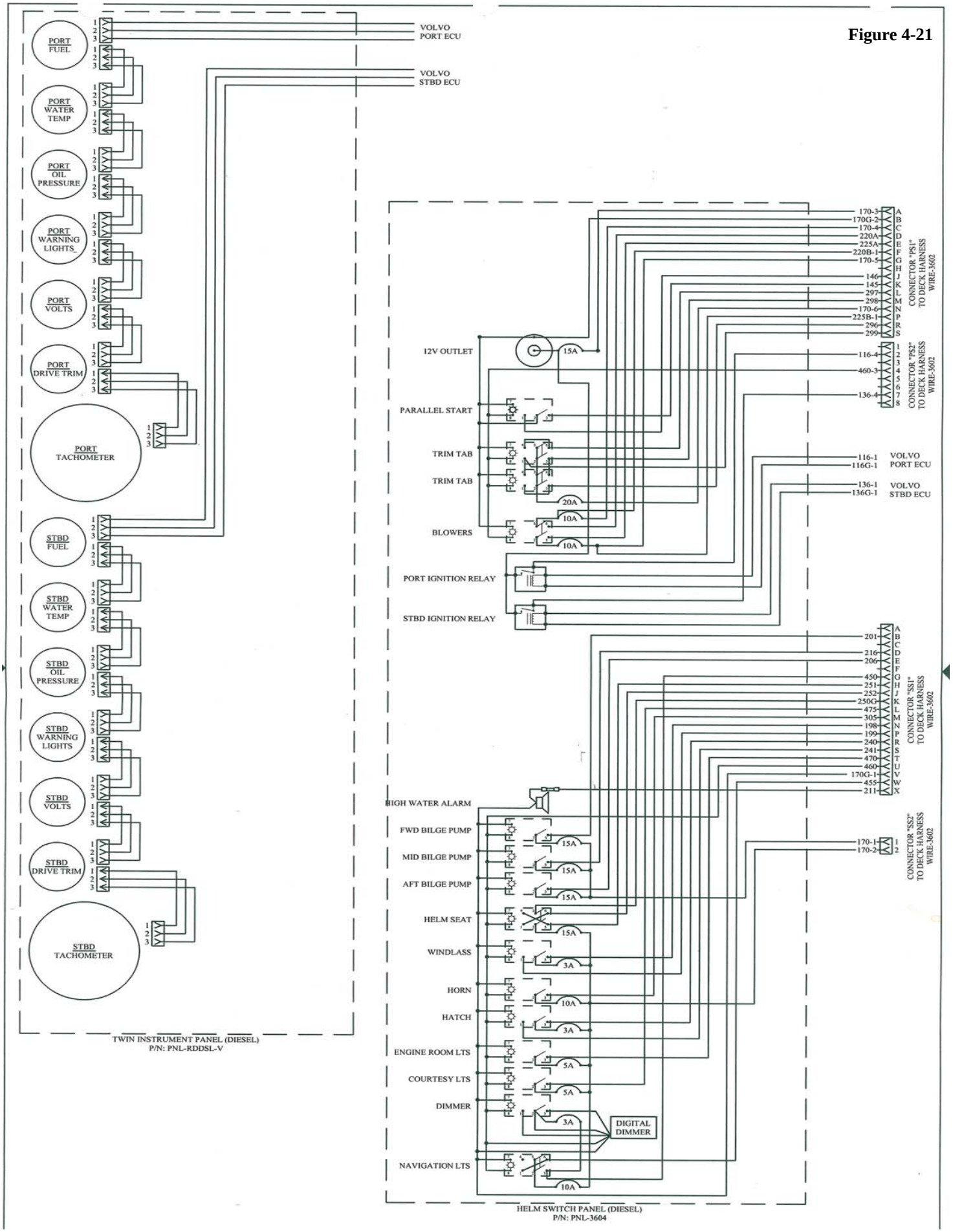
VOLVO
PORT ECU
VOLVO
STBD ECU
PORT
FUEL
PORT
WATER
TEMP
PORT
OIL
PRESSURE
PORT
WARNING
LIGHTS
PORT
VOLTS
PORT
DRIVE TRIM
PORT
TACHOMETER
STBD
FUEL
STBD
WATER
TEMP
STBD
OIL
PRESSURE
STBD
WARNING
LIGHTS
STBD
VOLTS
STBD
DRIVE TRIM
STBD
TACHOMETER
TWIN INSTRUMENT PANEL (DIESEL)
P/N: PNL-RDDSL-V
12V OUTLET
15A
PARALLEL START
TRIM TAB
TRIM TAB
20A
BLOWERS
10A
10A
PORT IGNITION RELAY
STBD IGNITION RELAY
170-3
170G-2
170-4
220A
225A
220B-1
170-5
146
145
297
298
170-6
225B-1
296
299
CONNECTOR "PS1"
TO DECK HARNESS
WIRE-3602
116-4
460-3
136-4
CONNECTOR "PS2"
TO DECK HARNESS
WIRE-3602
116-1
116G-1
VOLVO
PORT ECU
136-1
136G-1
VOLVO
STBD ECU
201
216
206
450
251
252
250G
475
305
198
199
240
241
470
460
170G-1
455
211
CONNECTOR "SS1"
TO DECK HARNESS
WIRE-3602
HIGH WATER ALARM
FWD BILGE PUMP
MID BILGE PUMP
AFT BILGE PUMP
HELM SEAT
WINDLASS
HORN
HATCH
ENGINE ROOM LTS
COURTESY LTS
DIMMER
NAVIGATION LTS
15A
15A
15A
15A
3A
10A
3A
5A
5A
3A
10A
DIGITAL
DIMMER
170-1
170-2
CONNECTOR "SS2"
TO DECK HARNESS
WIRE-3602
HELM SWITCH PANEL (DIESEL)
P/N: PNL-3604

Figure 4-22

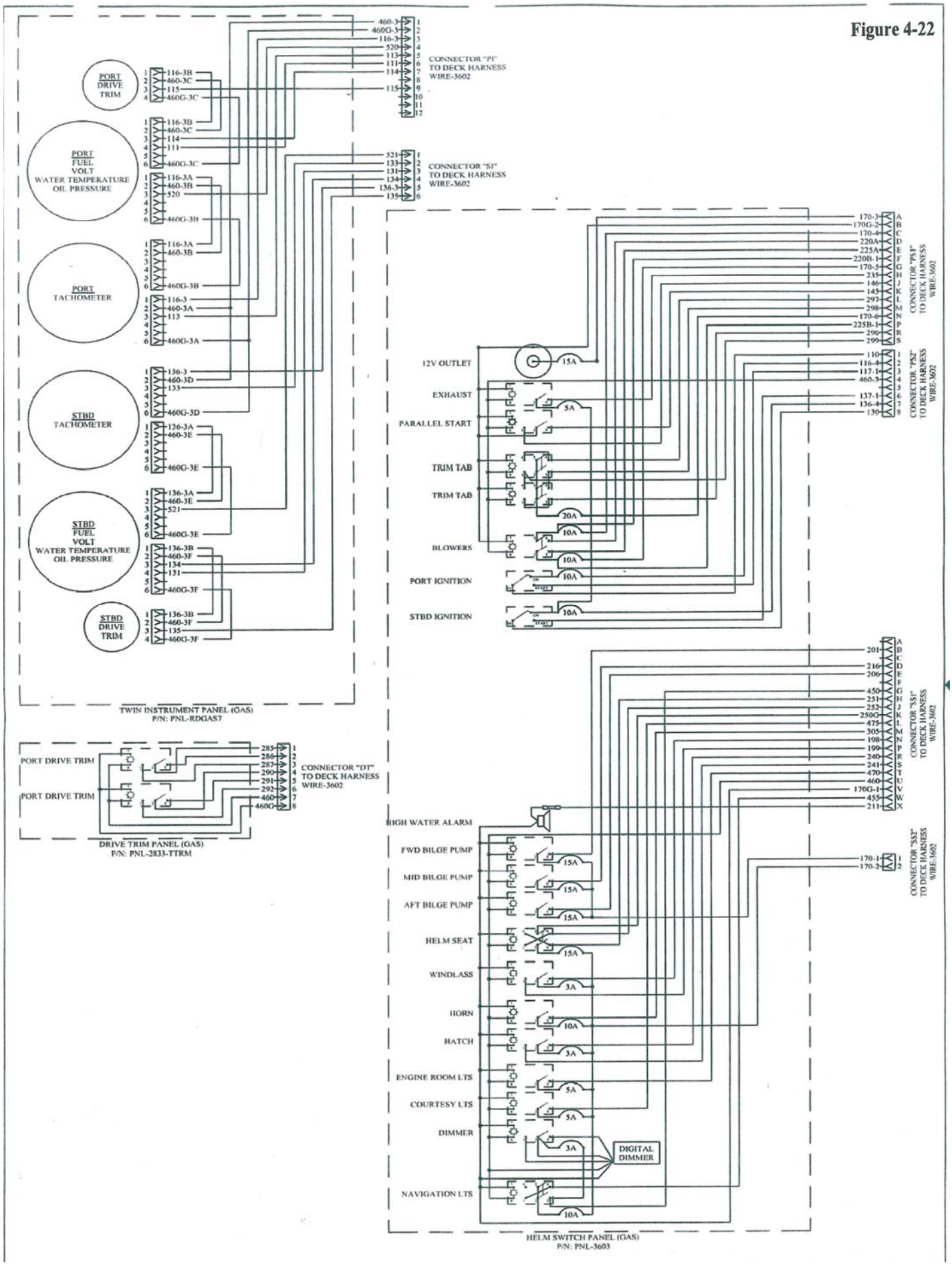
PORT DRIVE TRIM
PORT FUEL VOLT WATER TEMPERATURE OIL PRESSURE
PORT TACHOMETER
STBD TACHOMETER
STBD FUEL VOLT WATER TEMPERATURE OIL PRESSURE
STBD DRIVE TRIM
CONNECTOR "PI" TO DECK HARNESS WIRE-3602
CONNECTOR "SI" TO DECK HARNESS WIRE-3602
TWIN INSTRUMENT PANEL (GAS)
P/N: PNL-RDGAS7
PORT DRIVE TRIM
PORT DRIVE TRIM
CONNECTOR "DT" TO DECK HARNESS WIRE-3602
DRIVE TRIM PANEL (GAS)
P/N: PNL-2833-TTRM
12V OUTLET
EXHAUST
PARALLEL START
TRIM TAB
TRIM TAB
BLOWERS
PORT IGNITION
STBD IGNITION
CONNECTOR "PS1" TO DECK HARNESS WIRE-3602
CONNECTOR "PS2" TO DECK HARNESS WIRE-3602
CONNECTOR "SS1" TO DECK HARNESS WIRE-3602
CONNECTOR "SS2" TO DECK HARNESS WIRE-3602
HIGH WATER ALARM
FWD BILGE PUMP
MID BILGE PUMP
AFT BILGE PUMP
HELM SEAT
WINDLASS
HORN
HATCH
ENGINE ROOM LTS
COURTESY LTS
DIMMER
NAVIGATION LTS
DIGITAL DIMMER
HELM SWITCH PANEL (GAS)
P/N: PNL-3603

Figure 4-23

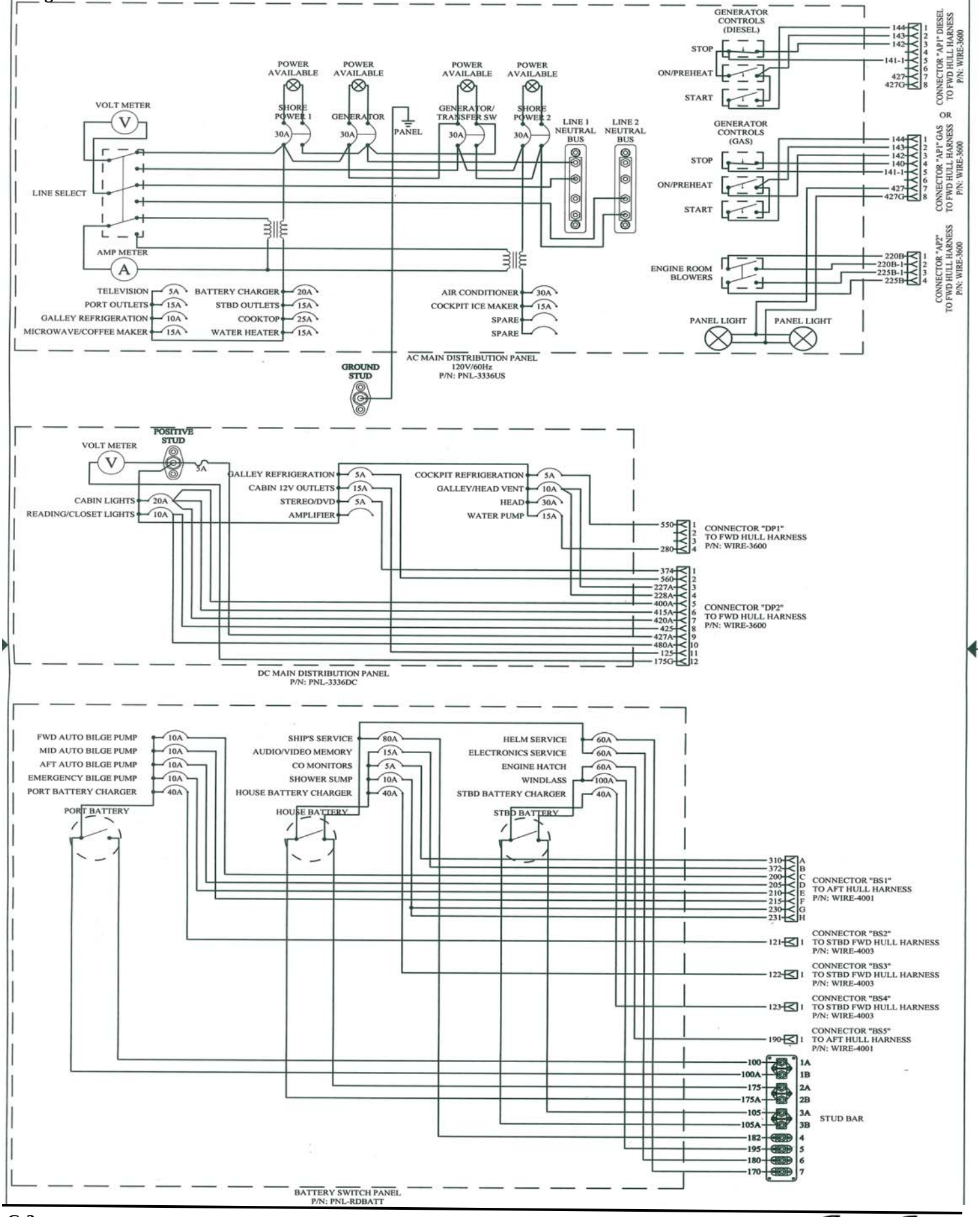

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Figure 4-24

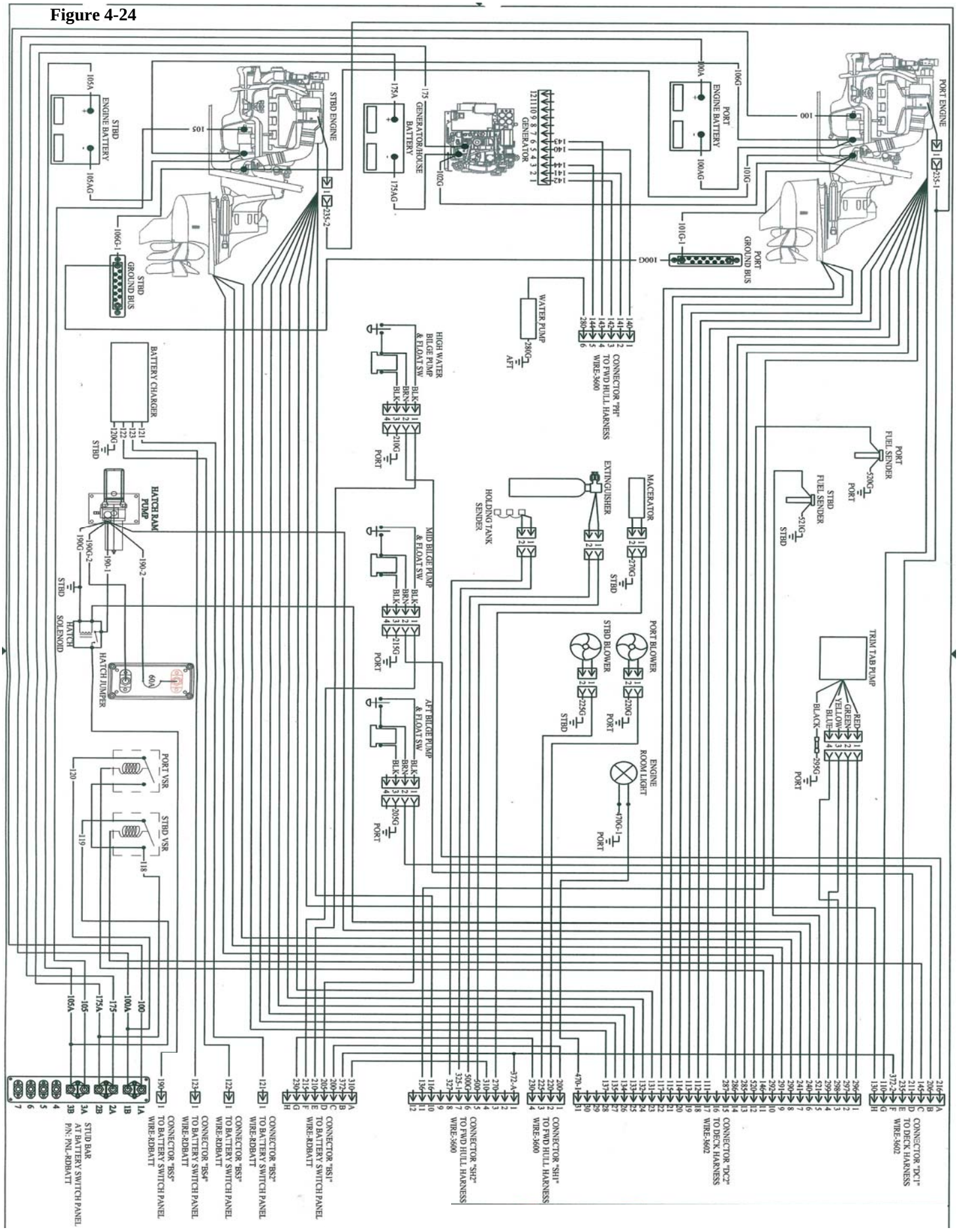
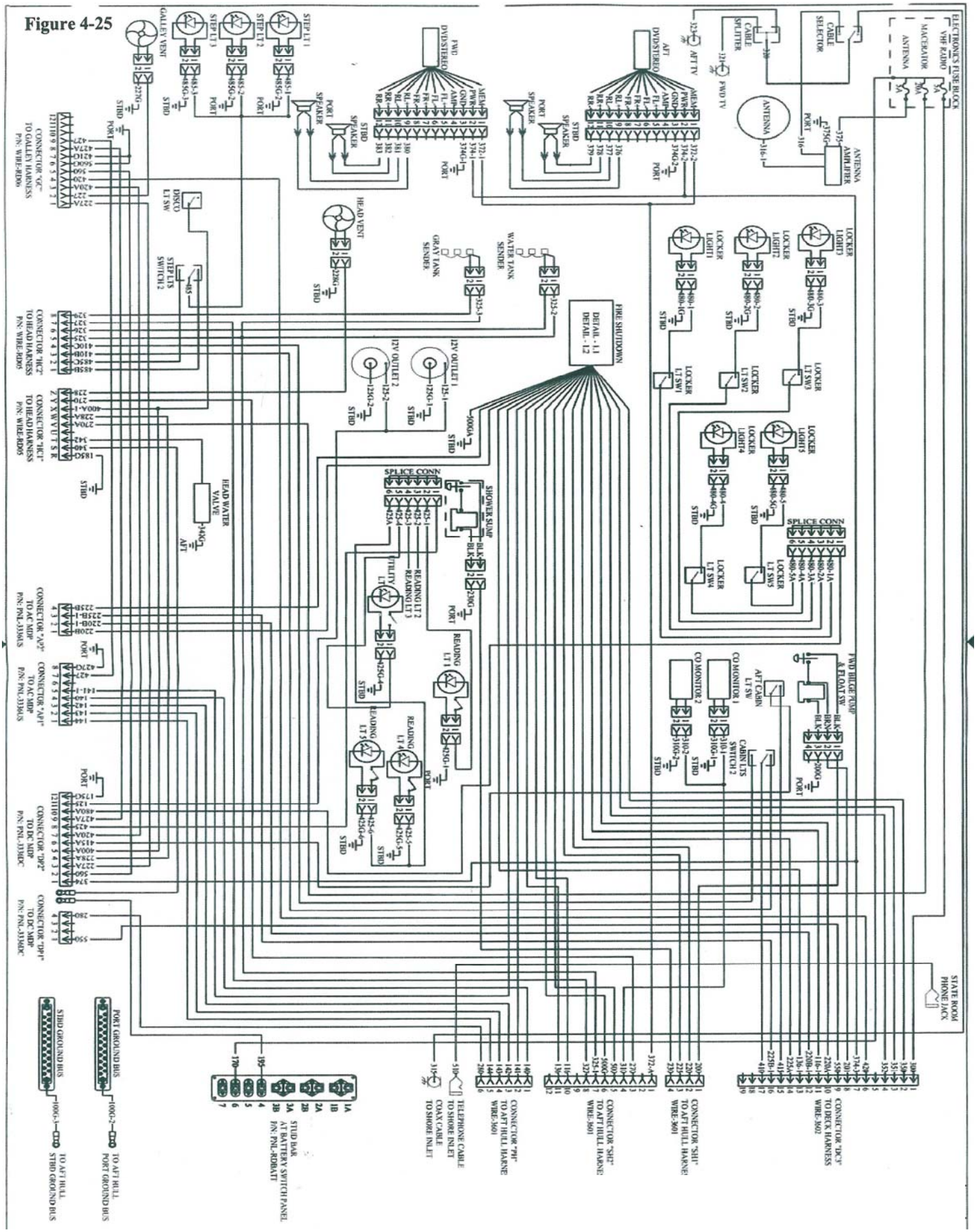

PORT ENGINE
STBD ENGINE
PORT ENGINE BATTERY
STBD ENGINE BATTERY
GENERATOR/HOUSE BATTERY
GENERATOR
PORT GROUND BUS
STBD GROUND BUS
WATER PUMP
CONNECTOR "PH1" TO FWD HULL HARNESS WIRE-3600
CONNECTOR "DC1" TO DECK HARNESS WIRE-3602
CONNECTOR "DC2" TO DECK HARNESS WIRE-3602
CONNECTOR "SH1" TO FWD HULL HARNESS WIRE-3600
CONNECTOR "SH2" TO FWD HULL HARNESS WIRE-3600
CONNECTOR "BS1" TO BATTERY SWITCH PANEL WIRE-RDBATT
CONNECTOR "BS2" TO BATTERY SWITCH PANEL WIRE-RDBATT
CONNECTOR "BS3" TO BATTERY SWITCH PANEL WIRE-RDBATT
CONNECTOR "BS4" TO BATTERY SWITCH PANEL WIRE-RDBATT
CONNECTOR "BS5" TO BATTERY SWITCH PANEL WIRE-RDBATT
STUB BAR AT BATTERY SWITCH PANEL P/N: PNL-RDBATT
PORT FUEL SENDER
STBD FUEL SENDER
TRIM TAB PUMP
BATTERY CHARGER
HATCH RAM PUMP
HATCH SOLENOID
HATCH JUMPER
HIGH WATER BILGE PUMP & FLOAT SW
MID BILGE PUMP & FLOAT SW
AFT BILGE PUMP & FLOAT SW
EXTINGUISHER
HOLDING TANK SENDER
MACERATOR
PORT BLOWER
STBD BLOWER
ENGINE ROOM LIGHT
PORT VSR
STBD VSR

Figure 4-25



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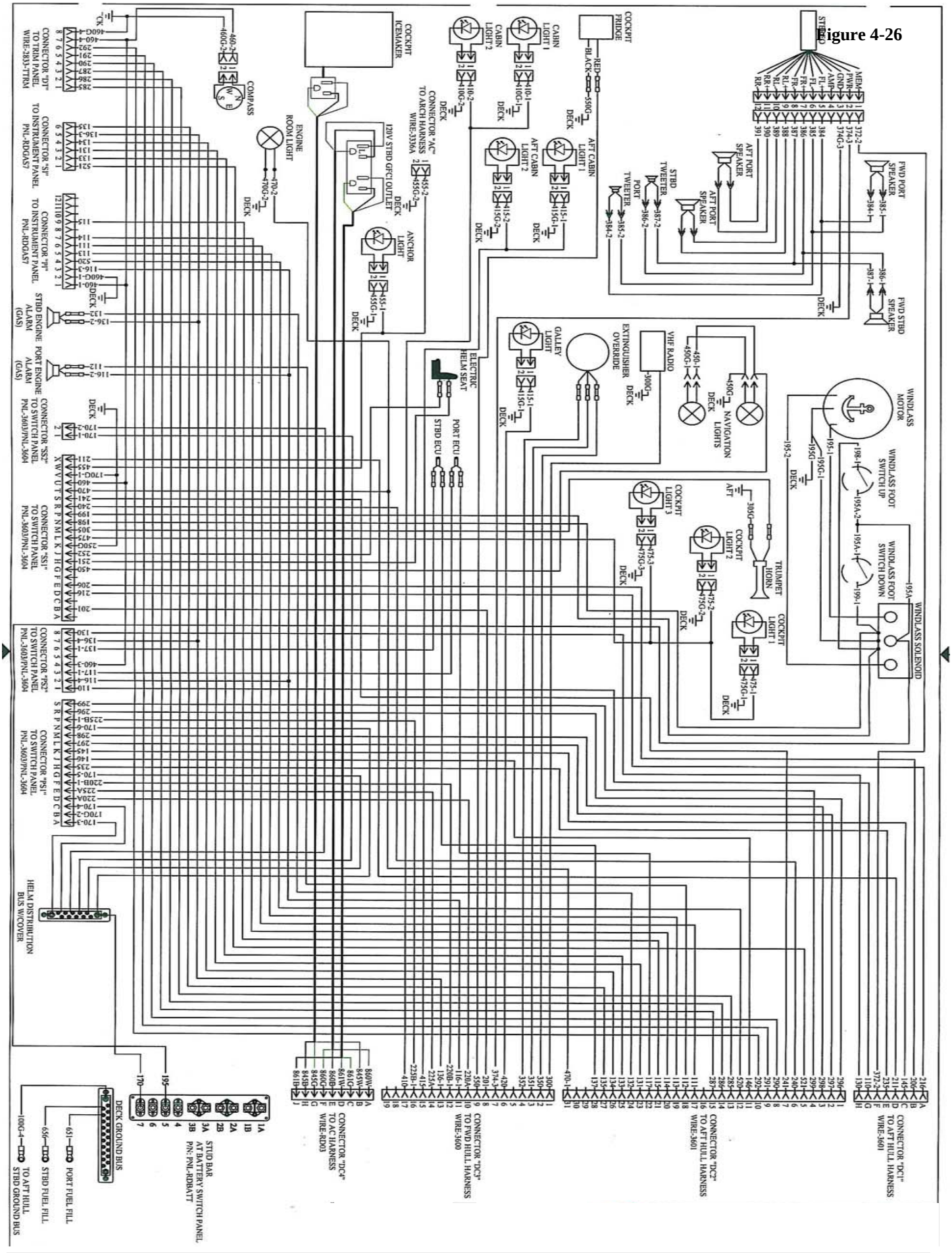
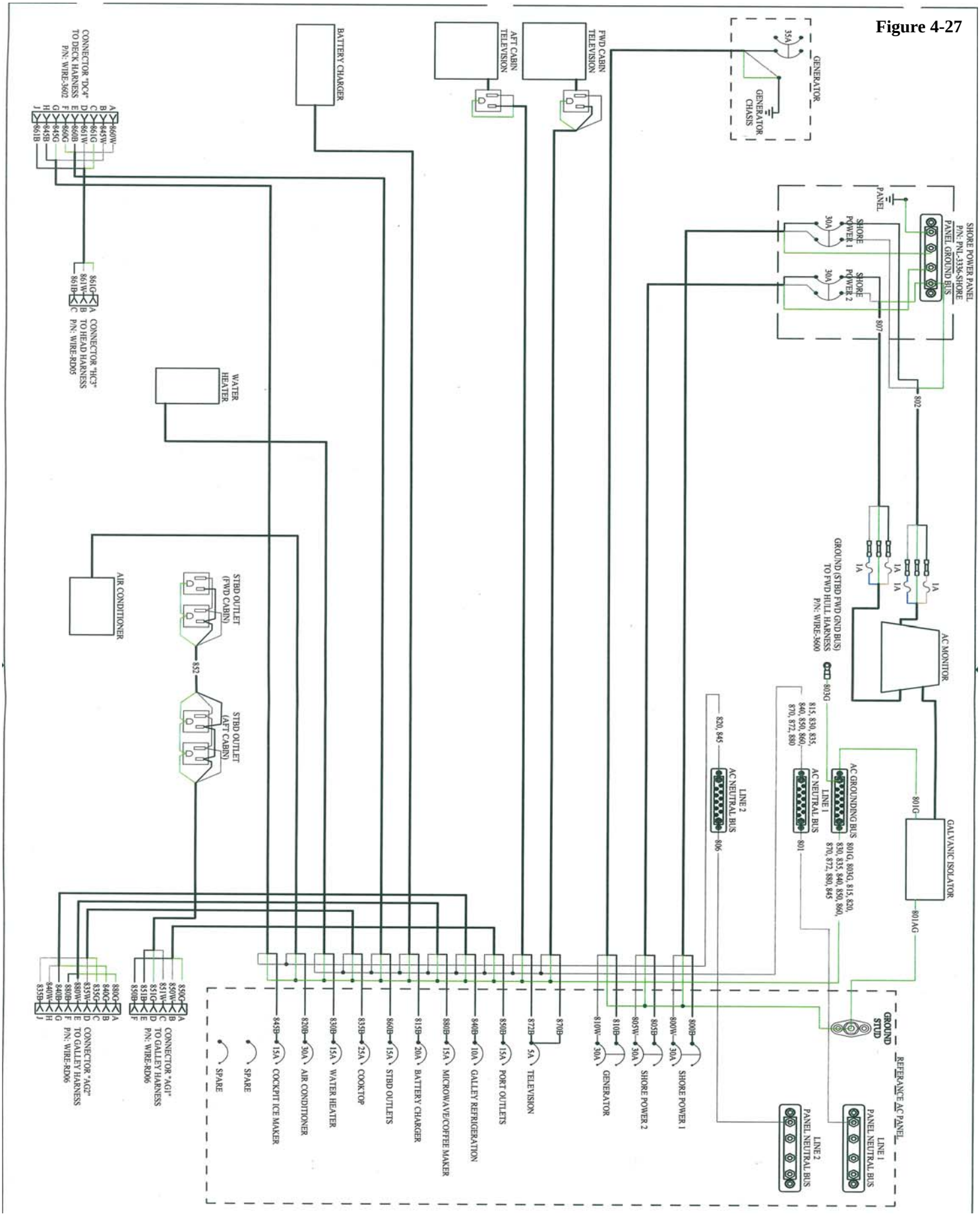


Figure 4-26
MEM
PWR
GND
AMP
FL+
FL-
FR+
FR-
RL+
RL-
RR+
RR-
STBD
FWD PORT SPEAKER
AFT PORT SPEAKER
STBD TWEETER
PORT TWEETER
FWD STBD SPEAKER
COCKPIT FRIDGE
CABIN LIGHT 1
CABIN LIGHT 2
AFT CABIN LIGHT 1
AFT CABIN LIGHT 2
COCKPIT ICEMAKER
CONNECTOR "AC" TO ARCH HARNESS WIRE-3336A
120V STBD GFCI OUTLET
ANCHOR LIGHT
COMPASS
ENGINE ROOM LIGHT
WINDLASS MOTOR
WINDLASS FOOT SWITCH UP
WINDLASS FOOT SWITCH DOWN
WINDLASS SOLENOID
NAVIGATION LIGHTS
VHF RADIO
EXTINGUISHER OVERRIDE
GALLEY LIGHT
ELECTRIC HELM SEAT
STBD ECU
PORT ECU
TRUMPET HORN
COCKPIT LIGHT 1
COCKPIT LIGHT 2
COCKPIT LIGHT 3
CONNECTOR "DT" TO TRIM PANEL WIRE-2833-TTRM
CONNECTOR "SI" TO INSTRUMENT PANEL PNL-RDGAS7
CONNECTOR "PI" TO INSTRUMENT PANEL PNL-RDGAS7
STBD ENGINE ALARM (GAS)
PORT ENGINE ALARM (GAS)
CONNECTOR "SS2" TO SWITCH PANEL PNL-3603/PNL-3604
CONNECTOR "SS1" TO SWITCH PANEL PNL-3603/PNL-3604
CONNECTOR "PS2" TO SWITCH PANEL PNL-3603/PNL-3604
CONNECTOR "PS1" TO SWITCH PANEL PNL-3603/PNL-3604
HELM DISTRIBUTION BUS W/COVER
CONNECTOR "DC1" TO AFT HULL HARNESS WIRE-3601
CONNECTOR "DC2" TO AFT HULL HARNESS WIRE-3601
CONNECTOR "DC3" TO FWD HULL HARNESS WIRE-3600
CONNECTOR "DC4" TO AC HARNESS WIRE-RD03
STUD BAR AT BATTERY SWITCH PANEL P/N: PNL-RDBATT
DECK GROUND BUS
PORT FUEL FILL
STBD FUEL FILL
TO AFT HULL STBD GROUND BUS

Figure 4-27



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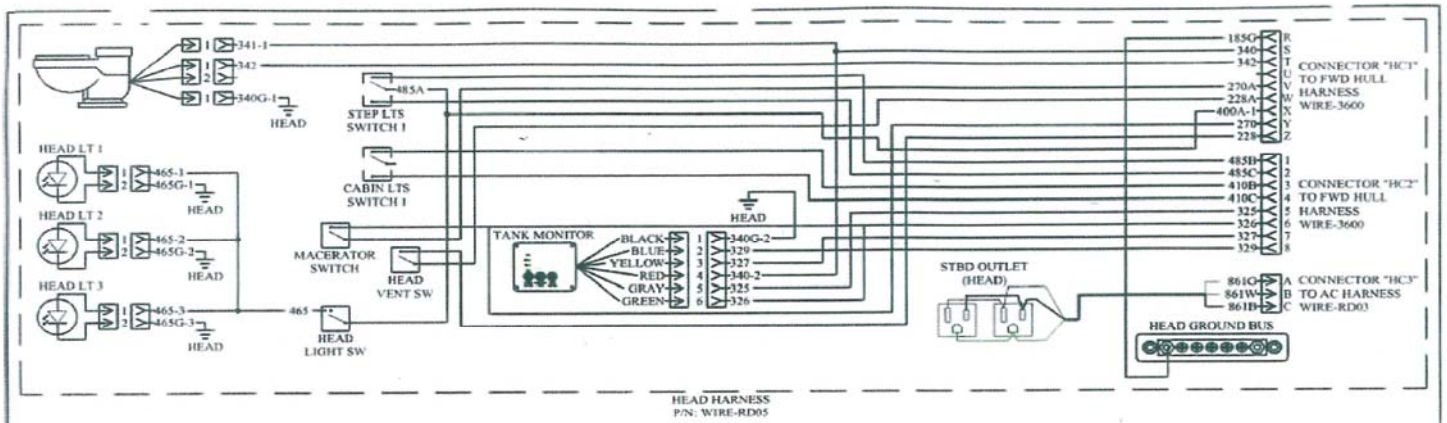
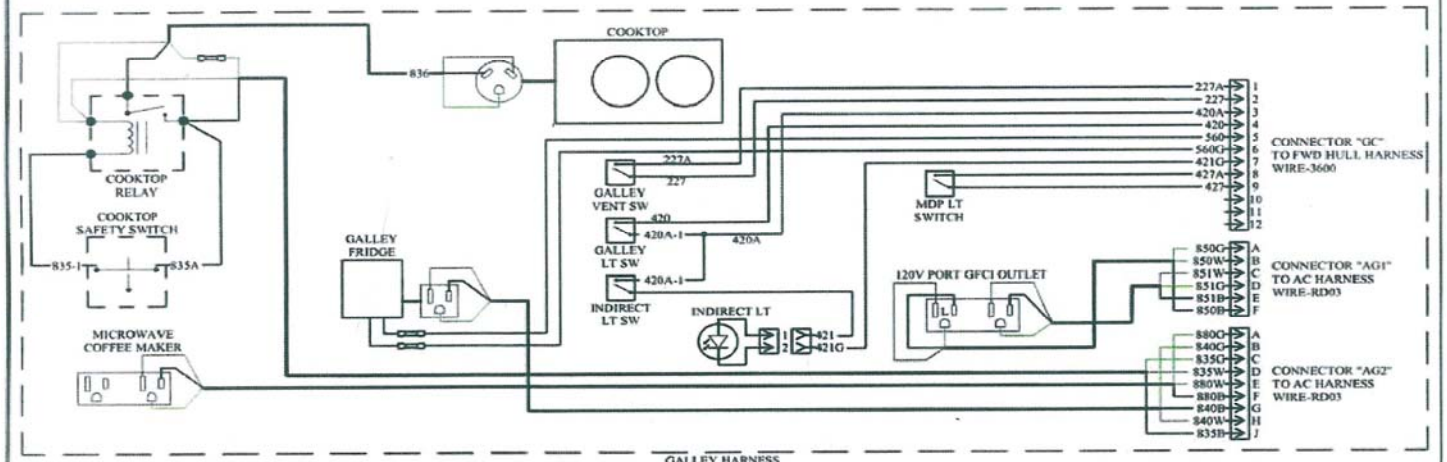
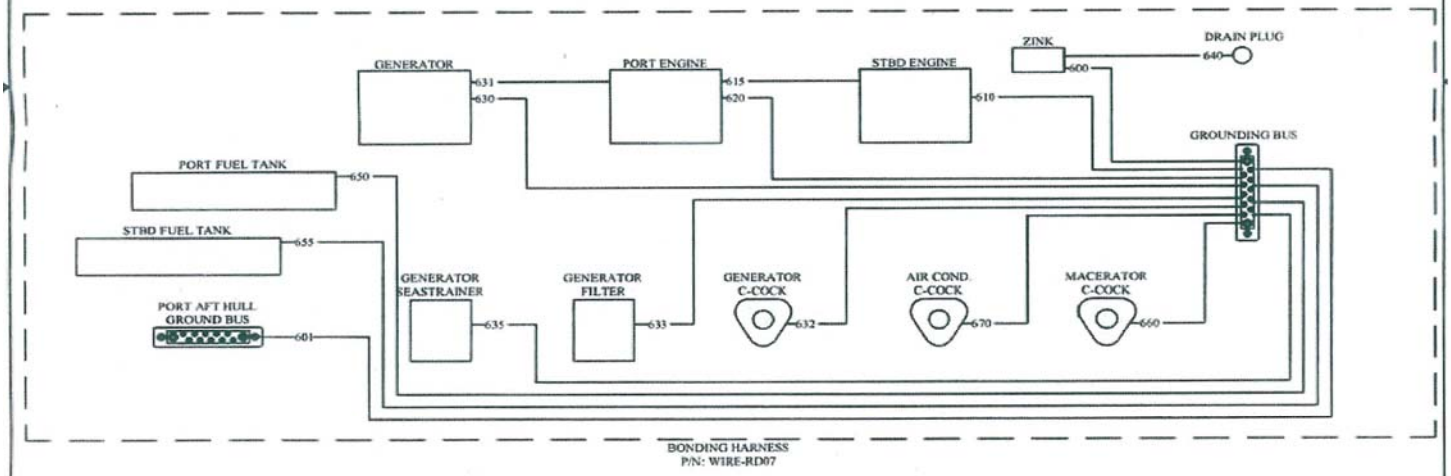


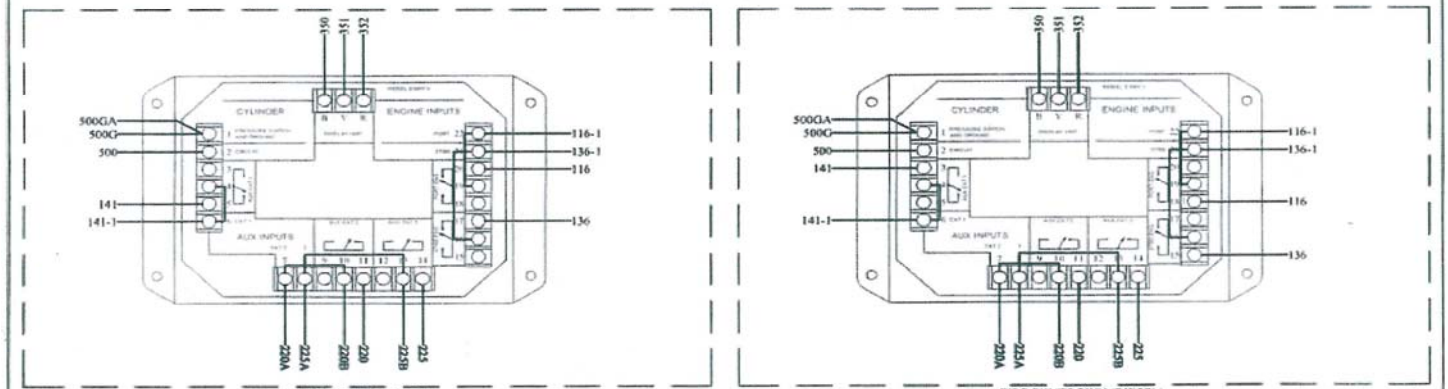
HEAD HARNESS
P/N: WIRE-RD05



GALLEY HARNESS
P/N: WIRE-RD06



BONDING HARNESS
P/N: WIRE-RD07



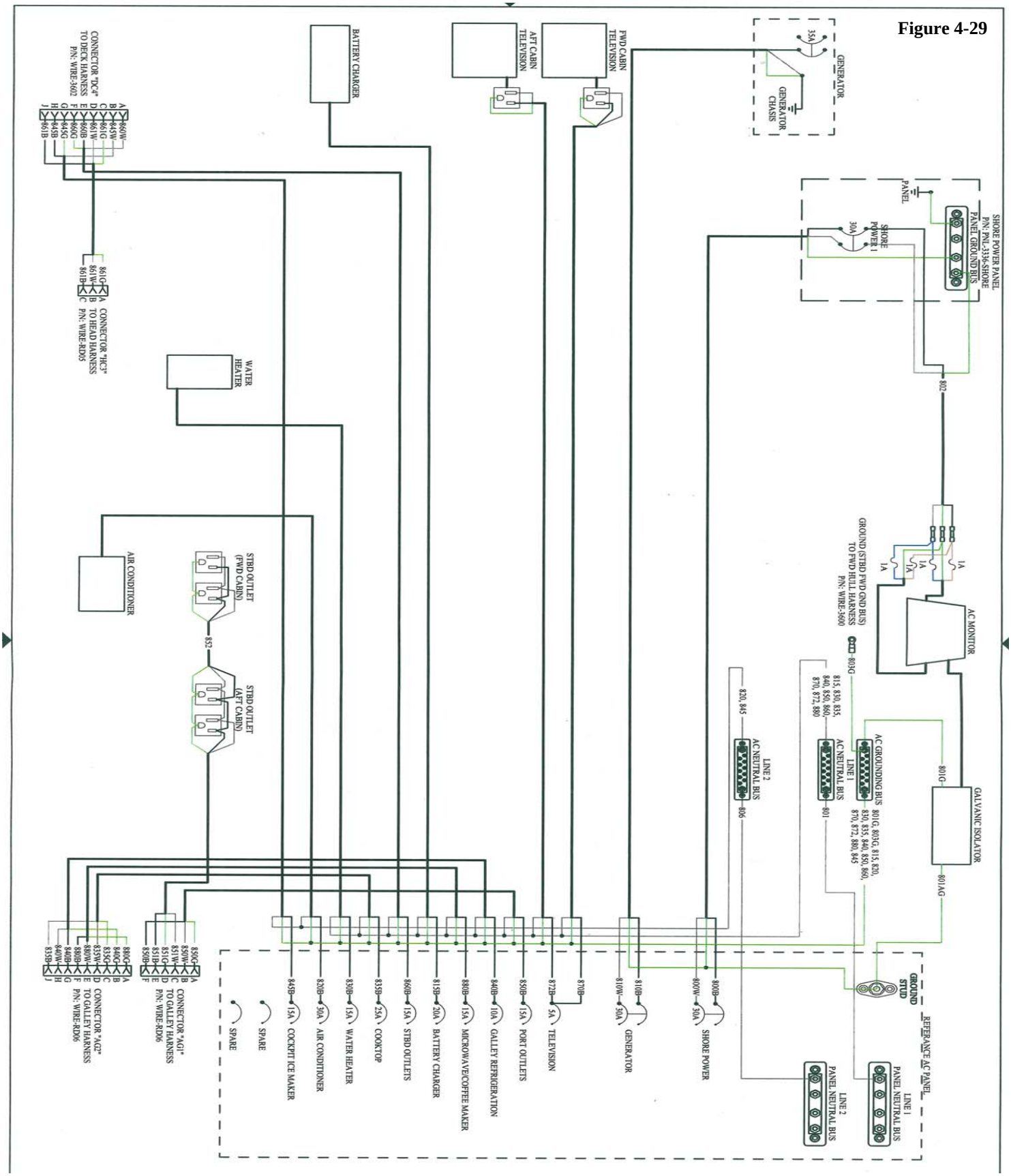
FIRE SHUTDOWN (GAS)
DETAIL - 1.1
REFERENCE P/N: WIRE-3602

FIRE SHUTDOWN (DIESEL)
DETAIL - 1.2
REFERENCE P/N: WIRE-3602

Figure 4-28

INTERNATIONAL

Figure 4-29



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